

Inside Dope

By GEORGE
F. TAUBENECKLearn to live and laugh —
thus delay your epitaph

Stories of the Week

Stories of the Week

Joe Slezak never cashed checks.

"I'm sorry," he'd say, "and I'll tell you why. I was a store-keeper in Czechoslovakia during the Nazi regime.

"Late one afternoon a midget came to my shop. He wanted me to hide him because the Gestapo was on his trail.

"I knew I'd get into trouble if I cached a small Czech!"

Most wives are good-humored enough to take things as they come. Particularly if they come from a furrier, exclusive dress shop, or jewelry store.

Hoover Helps

Over and over again at the All-Industry Exposition somebody would tell us a ribald story and conclude:

"Ha, ha, ha. I'll bet you can't clean up this one for your column."

Gentlemen, that might be an ill-advised wager. You see, we have able helpers.

Instance: Mrs. Ruth Hoover, coolly efficient Editorial Dept. Secretary, contributes the following antiseptic version of an old classic (which dates back to horse-and-buggy days, backyard water wells with pump-handles, and sparrows).

Two flying birds sniffed the welling-up aroma of a bologna factory, and dropped down to scavenge for lunch. They overate, natch, then perched on a pump-handle while digesting.

After resting awhile one bird attempted to wing on—and fell to the ground dead.

Second bird waited half an hour longer before taking off from the pump-handle. He fell to the ground also, still alive but too heavy to fly.

Moral: Don't fly off the handle when you're full of bologna.

Civilization Marches On?

Edward L. Henderson, President of the corporation which produces this publication (along with society and industrial periodicals and books—see us for fine printing), is a scientist at heart.

His medical studies were interrupted by World War Two, wherein the Navy converted him

(Concluded on Page 8, Col. 1)

Admiral's '58
Room Unit Line
Has Portable

CHICAGO — Admiral Corp. announced that its 1958 room air conditioner line consists of the "Coronet" and "Regency" series and a portable air conditioner only 12 in. high, 17 in. wide, and 14 in. deep, complete with built-in carrying handle.

Richard J. Bamberg, sales manager of the company's air conditioner division, said the completely new "low and thin" Coronet series was designed to occupy less window space. These models measure 14 in. high, 26½ in. wide, and 16¾ in. deep.

Four 1-hp. units are available in this series, including a 7½ ampere "Supreme" with single dial climate control selector switch, and three "Imperial" models with six pushbutton controls.

"Two Coronets (100S7 and 100L7) draw only 7½ amperes and can be plugged into a regular household multiple 115-volt outlet without costly rewiring where local codes permit," the announcement said. "One model (100L12) can be plugged into a single circuit electrical outlet."

Cabinets in the Coronet series have a new two-tone black and (Concluded on Page 2, Col. 4)

HUSSMANN AIDE

Wayne Clemens Dies
At NCRSA Meeting

CHICAGO — Wayne Clemens, assistant general sales manager, regional accounts division, Hussmann Refrigeration, Inc., collapsed and died of a heart attack Monday, Nov. 18, while attending the 11th annual convention of the National Commercial Refrigerator Sales Association.

Clemens, who was 44 years old, slipped to the floor in a darkened room as Marie Lawton, NCRSA secretary, presented a slide presentation of association activities. He was given artificial respiration and oxygen but was pronounced (Concluded on Page 17, Col. 4)

Virginia Smelting
Ups Eustis, Scribner

WEST NORFOLK, Va.—The board of directors of Virginia Smelting Co., with main offices and plant here, elected Augustus H. Eustis of Boston to fill the newly-created position of chairman of the board.

Eustis has been president of the company for the past 25 years.

At the same meeting A. Kenneth Scribner, formerly vice president and general manager, was elected president. Scribner has been associated with the (Concluded on Page 2, Col. 5)

Industrial Air Conditioning
Grows Interestingly

NOW is the time to get in on the ground floor. Currently enjoying its greatest boom, industrial air conditioning is perking on all 12 cylinders. Every day such firms as Carrier, General Electric, Westinghouse, York, Worthington, Trane, and Buensod-Stacey are fulfilling orders to air condition industrial plants. And it isn't a closed field by any means—not for contractors, at least.

It all began in a lithographing plant in Brooklyn back in 1902. Variations in humidity caused contraction and expansion of the paper between applications of different colored inks. Colors overlapped or failed to match those printed on another day. The problem was turned over to a young engineer, Willis Carrier. He devised a method to (Concluded on Page 10)

ASRE Sheds Some Light on Food
Preservation, Adopts StandardsSees Irradiation
'Long Way Off'

CHICAGO — The current status of some of the most important and controversial phases of the food preservation field got some clarification during the Food Preservation Conference held during the recent semiannual meeting of the American Society of Refrigerating Engineers:

1. Preservation of foods by irradiation appears to be a long way off, because of problems in production techniques and costs, and of questions on the savoriness and wholesomeness of foods processed in such a manner.

2. Frozen foods can capture a greater share of the food market, perhaps more than double what is being done now, but only if problems in proper handling in the distributing channels are solved, so that complaints about deterioration in (Concluded on Page 17, Col. 4)

MUELLER LEARNS

Most Home Cooling
Set for 76° F.

MILWAUKEE — Most residential air conditioning users in all climate zones set their thermostats at 76° F. or lower. This was brought out by Mueller Climatrol, Div. of Worthington Corp.'s analysis of a recent letter survey conducted among owners of Mueller air conditioning units.

In direct contrast to air conditioning industry recommendations that equipment be designed for indoor temperature of 80°, more than 90% of the 778 respondents stated their thermostats were set at less than 80° with two out of three setting them at 76° or less.

Cross-tabulation by year of installation indicated that the (Concluded on Page 17, Col. 1)

Heating Section
Next WeekIssued every Monday at
450 West Fort St., Detroit 26, Michigan
Established 1926Member,
Associated
Business
PublicationsMember,
Audit
Bureau of
CirculationsShow Crowd
Sets Record In
First 2 DaysSees Wide Variety of
New, Improved Items

CHICAGO, Nov. 20 — Some 10,000 members of the industry had registered in for the 10th Exposition of the Air Conditioning and Refrigeration Industry at the International Amphitheatre here, to view the products that some 260 firms are offering for the use of the industry in 1958.

Back in Chicago for the first time since 1951, the Exposition

Descriptions and photographs of new products shown at the 10th Exposition of the Industry will be published in subsequent issues of the NEWS.

was almost double the size of the show held here in that year.

The Exposition crowd, which the Show Committee said broke an attendance record for the first two days, saw a wide variety of new and improved products.

In the packaging equipment line, the emphasis was on the large and the small. This is to say, package air conditioners and water chillers are expanding to larger sizes, while the

HEIL-QUAKER

Forms Heating,
Cooling Firm

MILWAUKEE — Newly-organized Heil-Quaker Corp. will produce under one roof "a complete line of equipment to meet every home heating and air conditioning need," officials announced here.

The full and integrated line will be manufactured in the modern 430,000-sq. ft. Quaker plant at Lewisburg, Tenn., it was explained, while all administrative and sales offices and research center will be located at Nashville, Tenn.

Combining the central residential air conditioning and heating division of Heil Co. here with the Quaker space heating plant and facilities, the (Concluded on Page 17, Col. 4)

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Dependable Prescription for Refrigeration & Air Conditioning Equipment

Rx Always Specify READING copper Tubing

Made by Copper Tube SPECIALISTS



READING TUBE CORPORATION
EMPIRE STATE BUILDING NEW YORK 1, N. Y.
WORKS: READING, PA.



THIS 1958 Admiral Corp. "low and thin" room air conditioner is available in four 1-hp. models. "Coronet," shown here, is 14 in. high, 26½ in. wide, and 16¼ in. deep, operates on 12 amps, 115-v.

Admiral's '58 Room Units --

(Concluded from Page 1, Col. 2)
dove gray finish, two position adjustable air louvers, and can be mounted flush with a window, or through a wall or transom. Admiral claims that maximum cooling is achieved by using new thin tubing providing

a greater number of cooling surfaces in a smaller area.

The Regency series features a 1½-hp. (12-ampere, 115-volt) model and a 2-hp. unit for 230-volt lines. Each has a climate control dial thermostat, six pushbutton controls, permanent aluminum mesh filter, two-speed fan, and four 360° adjustable air louvers. This series incorporates new styling and an aluminum gold grille with greater open area for increased air intake.

"The air conditioners can be easily installed in just a few minutes," it was stated. "All moving parts are cushioned on resilient mounting to assure quiet operation. Use of a new squirrel-type evaporator fan further reduces the noise level but still assures maximum air movement."

Designed with an expandable mount on one side and a flange across the top and opposite side, the lightweight portable air conditioner "can be easily and quickly installed," according to Admiral. "It can be plugged into any electric outlet."

Model numbers and suggested list prices were announced as follows:

Model	Suggested List Price
PORTABLE	
75L7—115-v. 7.5 amp.	\$ Open
CORONET SERIES	
100S7—1-hp., Supreme, 115-v., 7.5 amp.	269.95
100L7—1-hp., Imperial, 115-v., 7.5 amp.	289.95
100L12—1-hp., Imperial, 115-v., 12 amp.	309.95
100L23—1-hp., Imperial, 230-v.	319.95
REGENCY SERIES	
150S12—1½-hp., Supreme, 115-v., 12 amp.	349.95
150L12—1½-hp., Imperial, 115-v., 12 amp.	379.95
150L23—1½-hp., Imperial, 230-v.	359.95
200L23—2-hp., Imperial, 230-v.	429.95

Thermostat included as standard equipment on all models.

Scribner Named --

(Concluded from Page 1, Col. 2)
company since 1921. He will continue as chief operating executive of this chemical company.

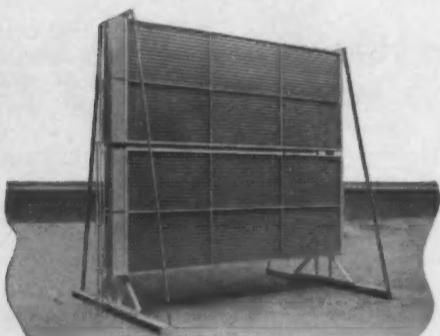
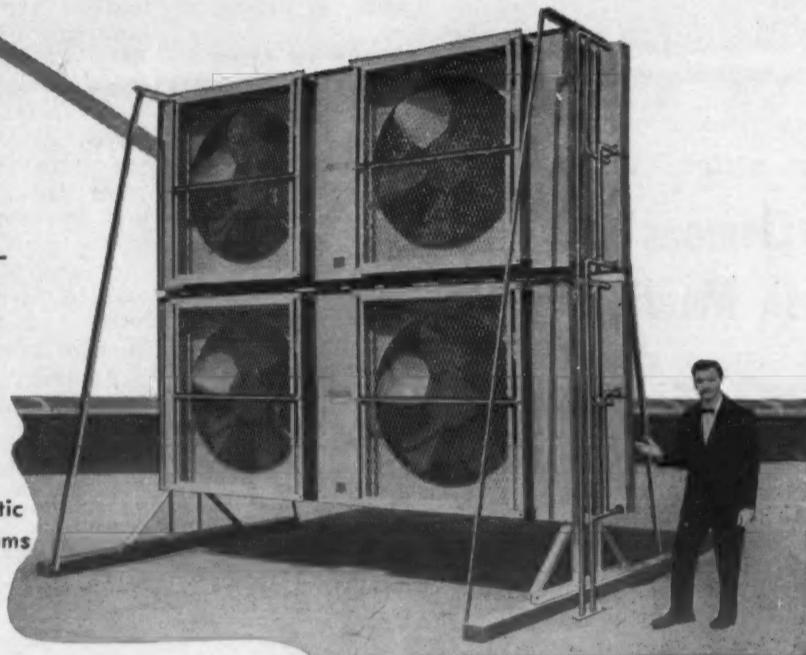
He is the third president in the company's 48-year history, the others having been the late W. E. C. Eustis, the founder, and his son, Augustus H. Eustis.

It was also announced that three of the several newly-created offices were filled as follows: R. F. Lotz, vice president-comptroller (formerly comptroller); Peter Eustis, vice president-secretary (formerly secretary); and D. W. Duncan, vice president-manufacturing (formerly plant manager).

F. A. Eustis of Boston remains treasurer of the company, and F. A. Eustis, II was elected an assistant treasurer.

KRAMER UNICON GETS BIGGER and BIGGER

There is only one answer to large capacity condenser problems — the KRAMER UNICON. Every day more engineers plan larger tonnage installations — 50, 100 and even — 800 tons. And every day UNICONS are shipped to all parts of the world for giant-sized installations. No other air-cooled condenser can match the long, successful record of UNICON, backed by thousands of applications since 1937 — in the widest range of tonnages and climatic conditions. Your condensing problems can be best answered by use of the best — the KRAMER UNICON.



Space-saver UNICON, as illustrated, serves a 60-Ton air conditioning system, yet takes but 70 sq. ft. of roof space.

UNICON is a remote-type air-cooled condenser that requires no water. KRAMER UNICON can be used with any size compressor, REGARDLESS of horsepower. Any size refrigeration or air conditioning system can be air-cooled with UNICON, REGARDLESS of tonnage. UNICON requires less horsepower, less piping, is easier to install and costs less. KRAMER UNICON performs best — even in semi-tropical climates.

WRITE FOR BULLETIN U-210D

KRAMER TRENTON CO. • Trenton 5, N.J.



DELCO FAN MOTOR IS SHORTER

Both shaded pole and permanent split capacitor designs save 20% in length

Delco has cut the size of shaded pole and split capacitor motors. The new designs are only four-fifths the length of previous models.

The new Delco motor is quieter and has a unique lubricating system. The lubricating compound consists of a cellulose carrier combined with a very high percentage of oil. This fluid combination provides superior lubrication under all operating conditions. The new motor can be mounted in any position. The lubricant carrier and efficient enclosure of the lubricant chamber combine to retain the oil effectively regardless of mounting position.

Both motors are available with one or both end frames enclosed and either full or partially ventilated main frames for maximum flexibility in product design. Sizes include 1/15, 1/10, 1/8, 1/6 and 1/4 h.p. in a wide choice of rigid and resilient mountings.

Contact your Delco Products sales office and get all the details on this new, smaller motor. Find out what a great advantage its smaller size can mean in your product.

MOISTURE RESISTANT INSULATION
Insulation components have been improved to offer maximum protection against moisture in high humidity air conditioning applications.

BUILT-IN TERMINAL BLOCK—Attachment of leads is fast and easy. Block may be used for one- or two-speed operation.

RUST RESISTANT THROUGHOUT—All metal parts are specially treated to resist rust and corrosion.

BEARINGS—Full steel backed babbitt bearings are precision bored to exacting tolerances . . . are set in rigid frames to maintain accurate alignment.



DELCO MOTORS

Delco Products, Division of General Motors, Dayton, Ohio

- APPLIANCE MOTORS • INDUSTRIAL MOTORS
- GENERATORS • ACTUATORS
- AUTOMOTIVE AND HYDRAULIC EQUIPMENT
- HERMETIC MOTORS AND CONTROLS
- RESIDENTIAL GARAGE DOOR OPERATORS
- AIR SUSPENSION COMPONENTS



Philco Highlights 3 Separate Cold Zones In '58 Refrigerator-Freezers

PHILADELPHIA — A nine-model refrigerator line featuring three "Super Marketer" combination refrigerator-freezers and a six-model freezer line split evenly between uprights and chests have been announced for 1958 by Philco Corp.

MISTY CRISPER

"Tri-frigeration"—three separate cold zones for safekeeping different kinds of foods—highlights the Super Marketer series, according to John Rishel, general manager of refrigerators-appliance division.

The refrigerator compartment provides a 38° F. zone, the "Cold Flow" meat locker holds meats at 33° F., the freezer 0°.

A new automatic misty

crisper which automatically sprays a fine mist over stored fruits and vegetables as the crisper door is closed is on all Super Marketer models. This mist-action retains the moist cold refrigeration needed for proper storage of produce.

Two of the Super Marketer models (RF-1688 and RF-1488) have the new portable ice

trays fit on top of the ice porcelain enamel interior and a keeper, and with one finger, re-striking white finish refrigerator compartment door and a textured gray freezer door. All freezer doors have the tip-toe pedal latch.

The three Super Marketer models have the new turquoise

In addition to the Super Marketer models, Philco also



TRYING OUT a 1958 Philco combination refrigerator-freezer is writer and model Betty Cornell with her twin children.

introduced for 1958, one two-door combination refrigerator-freezer with the freezer at the top, and two single door combination refrigerator-freezers, and three conventional refrigerators.

The two-door combination has 13 cu. ft. capacity, a 3.36-cu. ft. freezer, and automatic defrosting. The single door combinations have 12.4 and 10.4 cu. ft. capacity, respectively, and automatic defrosting.

The three conventional refrigerators have 11.1 cu. ft., 10.5 cu. ft., and 8.5 cu. ft., capacity, respectively.

'PUT-N-TAKE' DOOR RACKS

The three upright freezers feature "Put-N-Take" door storage racks for packages and cans, refrigerated shelves and, on the larger models, glide-out storage baskets. Interiors are turquoise porcelain enamel and exteriors white.

The chest freezers have Philco's exclusive "sloping front" design which puts 70% of the storage space above knee level. They have counterbalanced lids. The two larger models have separate freezing compartments and sliding storage baskets.

The models, with cu. ft. capacity and suggested list price, are as follows:

REFRIGERATORS

RF-1688—Super Marketer	15.8 cu. ft.	\$649.95
RF-1488—Super Marketer	13.5 cu. ft.	599.95
RF-1288—Super Marketer	11.7 cu. ft.	549.95
RD-1485—2-door combination	13.0 cu. ft.	489.95
RS-1284—1-door combination	12.4 cu. ft.	399.95
RS-1183—1-door combination	10.4 cu. ft.	339.95
RS-1182—1-door conventional	11.1 cu. ft.	279.95
RS-1082—1-door conventional	10.5 cu. ft.	No list
RS-882—1-door conventional	8.5 cu. ft.	No list
FREEZERS		
FV-2082—Upright, 20.2 cu. ft.	\$479.95	
FV-1482—Upright, 14.6 cu. ft.	379.95	
FV-1185—Upright, 11.6 cu. ft.	249.95	
FH-1885—Chest, 18.6 cu. ft.	399.95	
FH-1385—Chest, 13.0 cu. ft.	299.95	
FH-882—Chest, 8.4 cu. ft.	199.95	

Howard Buys

Westinghouse Universal Motor Div.; Eyes Merger

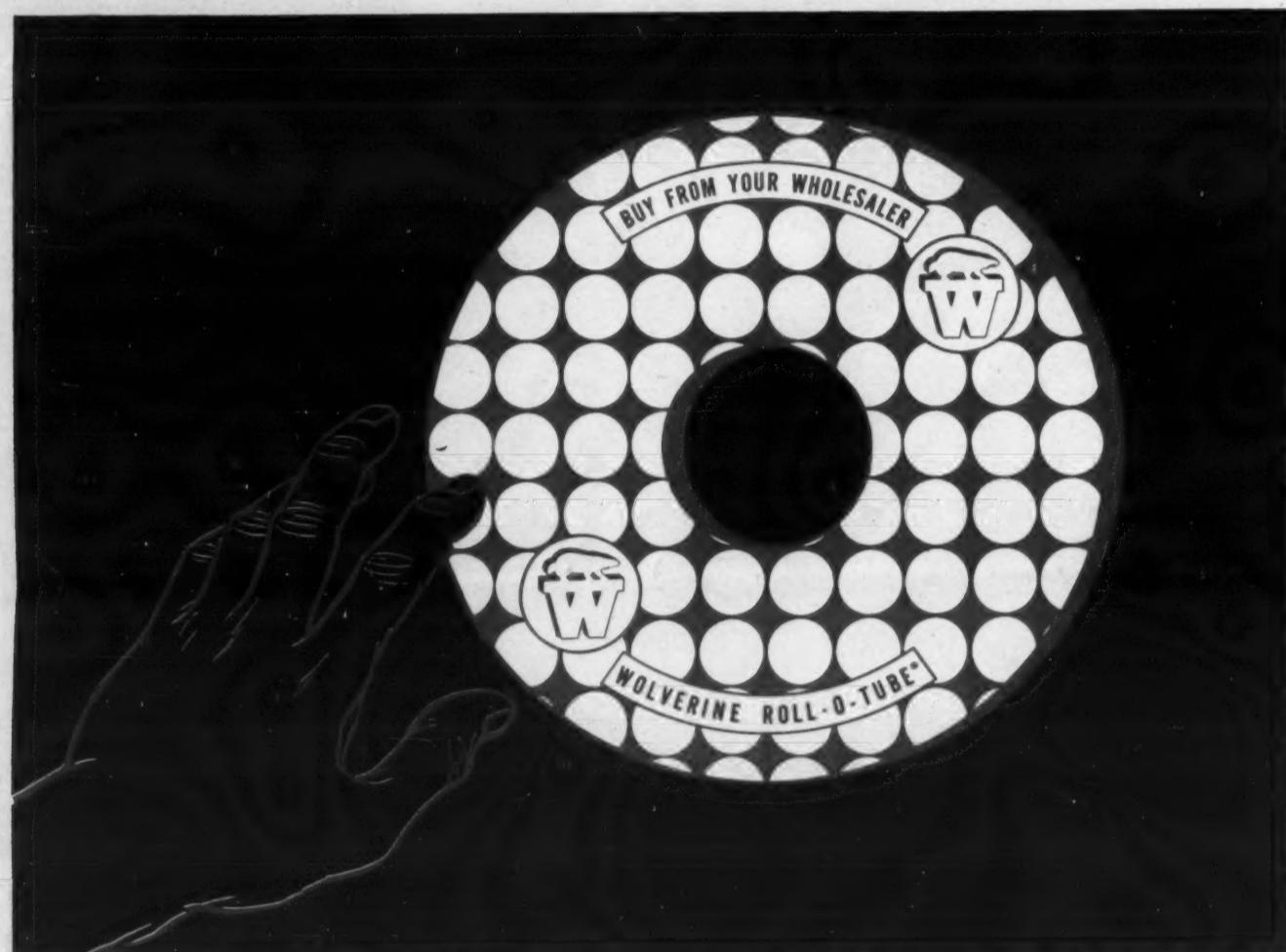
RACINE, Wis.—Howard Industries, Inc., local motor manufacturer, has purchased the assets of Universal Motor Div., Westinghouse Electric Corp., Lima, Ohio, it was reported.

Price was not disclosed, but the purchase did not include the land and building which will be used for other manufacturing by Westinghouse, according to Erling J. Hansen, Howard president.

Howard will move all machinery and equipment from Lima to its plant here for installation in a recently-completed 35,000-sq. ft. addition. Hansen said his firm has agreed to continue servicing Westinghouse customers who have bought Universal motors.

"This transaction will add considerable people to our payroll and should result in approximately \$2 million in additional annual sales," the Howard president explained.

Hansen also disclosed that Howard Industries is considering merging with another motor manufacturer. He was quoted as saying that his company is "looking at other motor companies, one in particular, with merger through an exchange of shares in mind."



customer-minded countermen

REACH

for the carton that's easiest to sell

Keeping customers informed of the latest product improvements is a sure-fire method for keeping them happy—and sold! That's why so many wholesaler countermen reach for Wolverine Roll-O-Tube® when customers ask for copper water tube or copper refrigeration tube.

Roll-O-Tube has a host of user advantages. By fastening the tube at one end and rolling the carton back, Roll-O-Tube acts as a time-saving reel. Because it is round, and rolls, it is easy to handle. Its convenient center hole makes carrying easy and its zipper-like gummed tape opening leaves the carton intact—lets it act as the perfect storage spot for unused tube.

Next time a customer asks for copper tube, reach for Wolverine Roll-O-Tube and show him its work-saving features. Tell him, too, that it contains rigidly quality controlled, completely dependable Wolverine copper tube. It's the perfect formula for making sales—and making friends. Write, too, for your copy of "Wolverine Tube is Easy To Sell."

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For more information about products advertised on this page use Information Center, page 12.



Where to find residential air conditioning dealers?

Today's key question in the residential air conditioning industry is being asked from every side: Who will sell the bulk of tomorrow's market? Appliance dealer, plumber, electrician or heating contractor? All have been mentioned but no single group has proven that they, above another, will control the market.

Truth is, some of all these groups will step forward as the air conditioning specialists of tomorrow. It depends entirely on each individual's determination to move ahead aggressively into the promising specialty of year-round residential air conditioning.

Meanwhile the problem: Amid this present dynamic development of distribution outlets the manufacturer is all but unable to identify his future volume dealer. Communication between product maker and potential seller is a challenge.

There is, however, one medium bridging this gap—AIR CONDITIONING & REFRIGERATION NEWS—the only weekly newspaper of this industry, read and referred to by distributors and contractor-dealers alike. Each year, the NEWS invests tens of thousands of dollars to include in its circulation, the new individuals and the new corporations entering the field.

Whatever his past ties, the new contractor-dealer recognizes his dependence on the NEWS for the information he must have to be or to stay a successful residential air conditioning specialist. Because of this he pays to receive it. So the NEWS becomes the one medium able to bring you into contact with new distribution points as they emerge.

What better showcase for your selling message than in the one business paper that is seeking out and is finding the new residential air conditioning dealers? Advertise regularly in the NEWS.

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Design and Operation of Low Voltage Thermostats

2. Design Features and Built-In Control Devices

By Douglas S. Stern, Sales Manager, Air Conditioning & Refrigeration Controls Div., General Controls Co.

ANTICIPATION

The need to overcome, or rather reduce the system lag and the operating differential led to the development of anticipation.

HEAT ANTICIPATION

First, let's consider only heat anticipation. If a small amount of artificial heat is introduced in the room thermostat, internally and close to the bimetal, the bimetal would be actuated at a rate faster than the normal rate of controlled room air. The results would be:

1. To increase the rate of response of the thermostat, thus improving the sensitivity by reducing the operating differential.

2. To minimize the effect of system and thermal lag.

Fig. 4 is a graph comparing room air temperature and an anticipated bimetal temperature. It will be noted that at any given time interval the bimetal temperature has a higher temperature than the room air temperature.

Also apparent is the fact that for any given temperature change the bimetal will sense this change in a shorter time interval than the room air. Thus the bimetal may be said to be *leading* the room air rather than *lagging*.

The results of room air temperature control using an anticipated bimetal thermostat are shown in Fig. 5.

The above benefits of heat anticipation have become so widely recognized and accepted that today heat anticipation is standard on the majority of all room thermostats.

While heat anticipation itself is standardly used, the form that it takes and the knowledge of its problems as well as its advantages are not nearly so well understood.

There are several types of heat anticipators all designed to do approximately the same job but varying in form and in the manner in which they do the job.

1. First is the so-called "fixed" anticipator. This is a small resistor of fixed value such as a carbon type or a wire-wound coil or spool which will generate a specific amount of heat when current flows through it.

Fig. 6 shows a schematic diagram of heat anticipation in a heating thermostat circuit. When the thermostat is satisfied—"off"—the contacts are open and the heater is non-operative, since there is no current flow

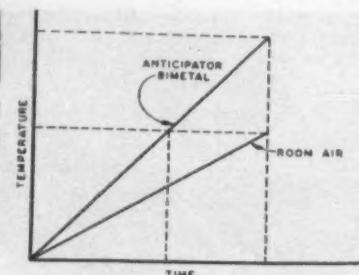


FIG. 4—Graph comparing room air temperature and an anticipated bimetal temperature.

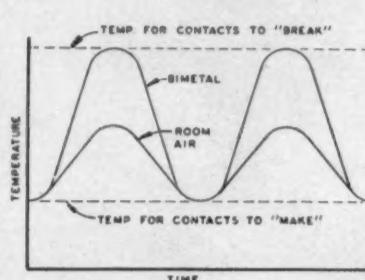


FIG. 5—Results of room air temperature control using an anticipated bimetal thermostat are shown here.

Used almost universally wherever cooling and heating systems are found, the room thermostat is taking on more importance as users seek, and engineers try to provide, closer control of temperatures for human comfort. The room thermostat is also performing new functions when used with year-round air conditioning systems.

Douglas Stern is an engineer and sales executive with many years' experience in the field of controls as they relate to the air conditioning industry. He has presented discussions on the subject of the room thermostat before industry groups, and in this series of articles he offers a detailed summary of the design characteristics and functions of the room thermostat in its present applications. This is the second instalment in the series.

source raises the room air temperature. will determine the cycle rate of the system.

The heat output of the heat anticipator is proportioned to the square of the current times the resistance of the heater ($W = I^2R$). This type of heat anticipator is dependent on current flow; the current flow, in turn, is determined by the size of the relay, gas valve, etc., in the primary heating system. The wattage of the heat anticipator

Fixed anticipators are supplied in many different wattage ratings and permit adapting to any desired cycle rates and to match any primary control. Table 1 is a table listing typical valves and applications of "fixed anticipators.

2. A "variable" heat anticipator does exactly what the (Continued on next page)

NOW GENERAL ELECTRIC AIR CONDITIONING AS

*Lightest 30-ton unit in the business—
by as much as 2000 lbs.—
and completely self-contained*

This new General Electric Unit is not another "octopus"—no outside fan motors, filters, controls or other protruding parts. It's as clean-cut as a 3-ton job. Air discharge can be ducted from front, back or top. And it's up to 2000 lbs. *lighter* than other 30-ton units.

General Electric also announces new 20 and 25 ton "packages". These 3 new models, added to the existing units, give you a line to meet *every* requirement for commercial and industrial air conditioning.

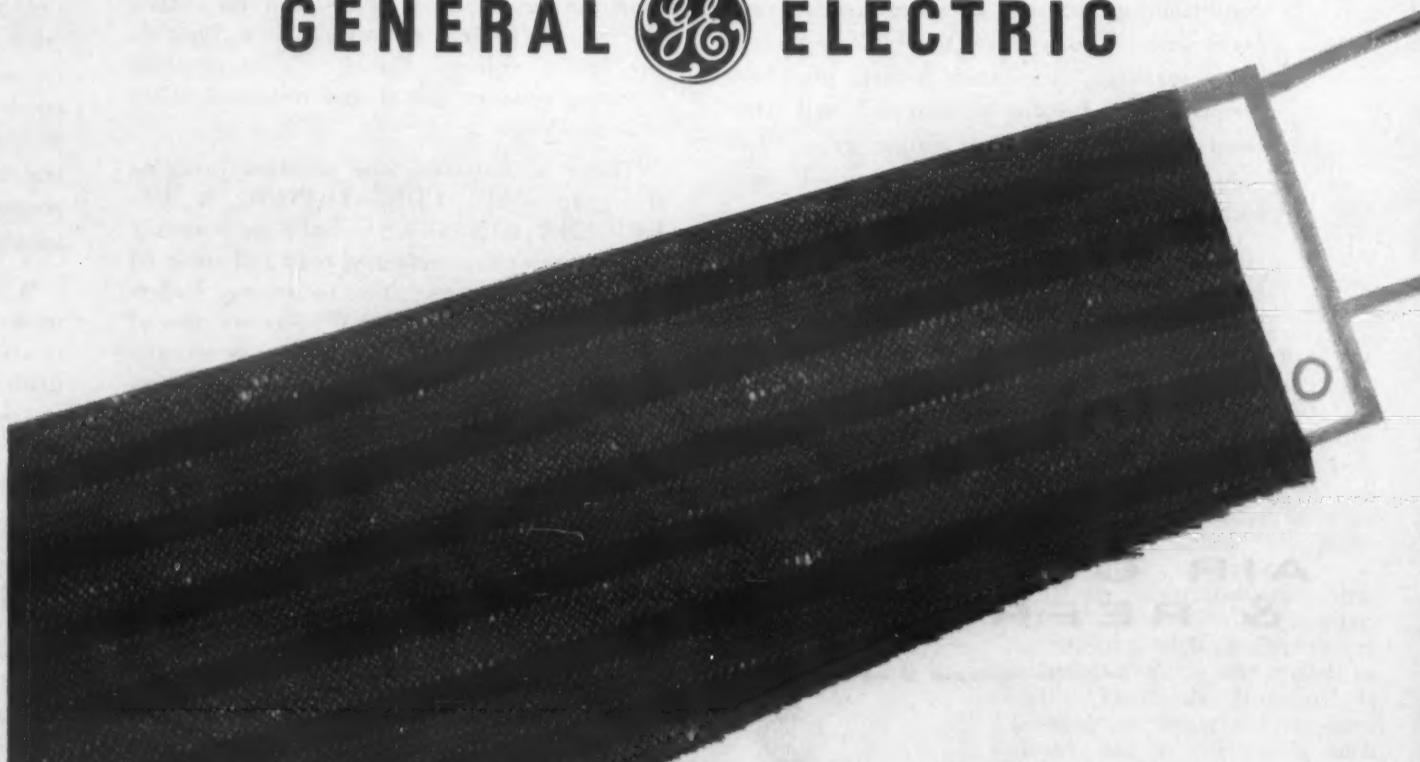
And what a line! Floor-mounted units in 3, 5, 7½, 10,

15, 20, 25 and 30 ton capacities! New air-cooled split systems in 3, 4, 5, 7½ and 10 ton capacities! And self-contained ceiling-mounted units—air-cooled in 3 and 5 ton capacities—water-cooled in 3, 5 and 7½ ton capacities! And there's more to come in 1958!

Get on the bandwagon! Sell General Electric Zone-by-Zone Air Conditioning for more profit in 1958! General Electric will presell prospects for you with powerful advertising, sales promotion and direct mail. See your distributor or mail coupon for complete details.

Progress Is Our Most Important Product

GENERAL ELECTRIC



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Send for the New 1957
Directory & Alphabetical Guide
Top Quality, Low Prices,
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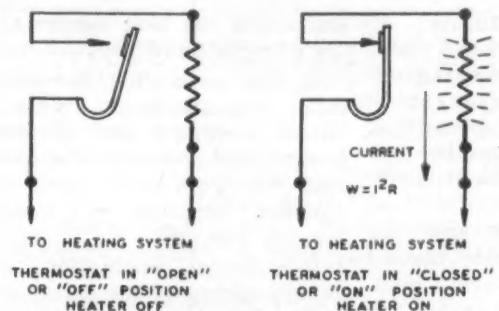


FIG. 6—Shows a schematic diagram of heat anticipation in a heating thermostat circuit.

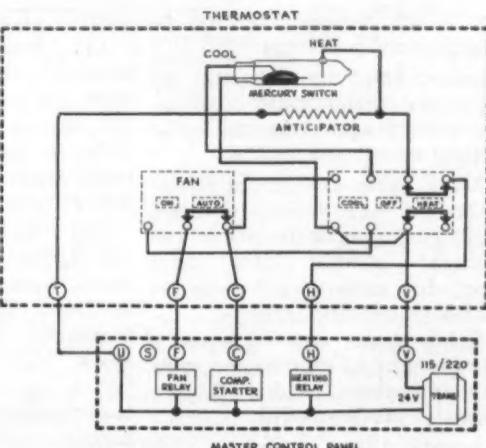


FIG. 7—A "voltage" type heat anticipator is actually a "fixed" anticipator but is wired in parallel with the thermostat heating control circuit rather than in series with this circuit as in the case of a fixed anticipator.

Low Voltage Thermostats--

(Continued from preceding page)

"fixed" heat anticipator does. However, since it is in effect a variable resistor, different heat anticipation value can be secured for various primary heating circuits simply by varying the position of the slider on the resistor.

3. A "voltage" type heat anticipator (Fig. 7) is actually a "fixed" anticipator, but is anticipator is completely independent of the load current flow

wired in parallel with the thermostat heating control circuit of the heating control circuit, rather than in series with this and therefore, one selected valve circuit, as is the case of a voltage anticipator can be "fixed" anticipator. Thus the used with all heating circuits. Disadvantages of this type of

ANTICIPATOR

225 Solenoid	180 Solenoid	B-50L, G-1, K-3, E-55, etc.	Perfex Primary	B-50A, B, B-50K C, H-0
			R-3 Relay	
			H-1, H-2, H-3	R-4 Relay

Brown-Yel. Brown-Blue Blue-Yellow Orange Red Red-Yel.

To determine anticipator for other applications:

1. Obtain the current (amps.) drawn by primary control from name plate data or by placing ammeter in circuit.
2. Select proper anticipator color from the table below.
3. To provide longer heating cycle, refer to table below and select the anticipator one step above the one installed. To shorten heating cycle choose anticipator one step below the one installed.

Amperes	Color	Amperes	Color
1.1	Brown-Yellow	.36	Green
.94	Brown	.33	Orange-Yellow
.83	Brown-Red	.29	Orange-Green
.72	Brown-Blue	.25	Red
.63	Orange	.22	Green-Blue
.55	Blue	.11	Orange-Red
.48	Blue-Orange	.10	Red-Yellow
.41	Blue-Yellow	.09	Green-Yellow

TABLE 1—A table listing typical valves and applications of "fixed" anticipators.

anticipator lie in the fact that one additional wire must be run

from the transformer to the thermostat, and the heat output of the anticipator is very greatly affected by voltage variation.

4. A "cycle" heat anticipator is actually a "fixed" heat anticipator which is fastened to the bimetal itself. It tends to increase the sensitivity of the thermostat since heat is applied directly to the bimetal by conduction rather than depending upon convection and radiation, as is the case of the fixed anticipator. It is difficult to change the value of a cycle anticipator in the field, and consequently, its use has been limited.

5. A bimetal anticipator is an anticipator in which the current flows through the bimetal itself when the contacts are made. By careful selection of the bimetal, this type of anticipator can be used.

However, obviously this is the most fixed of all fixed anticipators, and therein lies its critical disadvantage. It is generally used on line voltage thermostats only—which are not a concern of this discussion.

It is interesting to note that, while the anticipation of a bimetal anticipator can be used successfully on heat anticipation, it works to a definite disadvantage when the thermostat is used as a cooling thermostat. Thus a heating thermostat which can handle 13 amps at 115 volts can handle only 1 or 2 amps as a cooling thermostat.

The reason is interesting. The heat generated by the current flow through the bimetal handling 13 amps is so great that the air temperature would have to be reduced greatly—perhaps as much as 20° F.—before it would cool the bimetal sufficiently to permit it to warp and break the contacts. Thus a thermostat set at 75° F. would not break its contacts until the room air reached an undesirable 55° F. and the thermostat would have a 20° F. differential.

(To Be Continued)



Commercial and Industrial
Air Conditioning

Mr. R. D. Raley
General Electric Company, Dept. A-10
Commercial and Industrial Air Conditioning
5 Lawrence St., Bloomfield, N. J.

I'm interested in doing business with General Electric in 1958. Please give me complete details.

Name _____

Firm Name _____

Address _____

City _____ Zone _____ State _____

MINERALLAC



... Messenger

Outserves! Outlasts!

In Zinc-plated Steel and Everdur. All sizes. Insulating bushings available. Top quality. Permit quick wiring. Send for literature.

MINERALLAC ELECTRIC COMPANY
25 N. PEORIA ST. • CHICAGO 7, ILL.

Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1) to a radar (electronics) specialist. Currently his specialty is business administration, but he still follows avidly the progress of science.

Today his scientific interests range the entire spectrum from pleasant technical developments (like hi-fi) to the macabre, as witness this little gem he dropped on our desk.

News to chill your blood: now available is a face mask which will fit every civilian in our nation. It will protect wearers from malicious chemicals, bacteria, and radioactive fallout (also, presumably, falling Sputniks).

This pessimistic device composes and disposes its com-

ponents (filter, exhalation valve, and eye lenses) inside plastic forms of varied sizes.

Regardless of individual variations within each dimensional range, the appropriate mask will adjust itself to the contours of the wearer's head. Doesn't that thought comfort you?

"Bully for them," shall we say? Well, whadda you think?

Further gory details: a head harness, capable of a 300% stretch, is attached. You exhale through a valve under the chin. A baffle plate prevents eye lenses from fogging. Some 7,500 masks can be mass-produced in a 24-hour period.

Oh, happy day!

Sales Commission Plans Becoming Obsolete

Sales incentives based on percentages are obsolete, according to consultants who advise the AMA, ABP, and other associa-

tions which devote attention to management problems.

Reason they are obsolete: no longer do conventional commission percentages automatically improve corporate profits.

"Many sales executives blindly aim for high volume without considering corporate needs for increased profits and seed money for expansion," consultant Ed Gould declares.

"Other goals can be equally as important as volume, or even more important," adds Dexter Keezer of McGraw-Hill.

"Among these are more new accounts, bigger business from stabilized accounts, more attention to fringe prospects, less turnover, and special emphasis on Prestige Accounts—those big wheel customers whose patronage influences and impresses their suppliers and smaller competitors."

Gould predicts the following changes will occur in sales in-

centive plans of the future:

(1) Fewer commission plans, because straight-percentage-of-sales compensation takes control out of the hands of executives. Often a salesman can be paid more than the president under this arrangement.

(2) More assured base salary (plus performance bonus) plans, because they permit management control, yet retain the incentive principle. Furthermore, they prevent territorial fights amongst salesmen, thus contributing to teamwork and higher profits.

(3) Better designed incentives, with compensation based not especially on volume, but tied to profit contribution and management objectives (bonus for landing a Prestige Account is a prime example).

(4) Incentives designed with long-range growth in mind, rather than this year's balance sheet. They will be aimed at

promoting the best interests of the company and its customers.

In this connection, the salesman who patiently woos a "dead" customer into aliveness is rewarded; whereas the salesman who gets lucky "over the transom" business isn't kudoed for his windfall.

(5) Better evaluation and understanding of the salesman's basic job—the methods and manners by which he influences people through his knowledge of the market, and by his personality.

Good points, these.

Invisible Advertising

They didn't know what hit 'em. Some 45,000 movie patrons who sat through Hollywood's super-colossals in a New Jersey theater were influenced by advertising they didn't realize they saw.

"Invisible" commercials flashed before their eyes every five seconds or so—so quickly that patrons were unaware of them. After repeated unconscious and subconscious urging to eat more popcorn and drink Coca-Cola, vending machine and lobby sales roared upward.

Now they tell us. Executives of a firm self-tagged Subliminal Projection Co. explain that those movie-goers were subjected to advertising "below the threshold." To our way of thinking, it's also below the belt.

Motivational researcher James M. Vicary is credited with creating this new dimension in advertising. He claims it obliterates interruptions for sponsor messages on movie or TV screens. (That's in favor. It'd be nice not to be bothered by station breaks for commercials.)

However, even young Vicary believes the subconscious approach eventually may have to be regulated—voluntarily, we trust.

Precise details of this eerie form of persuasion are lacking (the patent hasn't been granted yet). However, psychologists long have known that perception can take place before a person is aware of the stimulus. As far back as 1863 the entire subject was reviewed in the American Journal Psychology.

Actually, these signals aren't quite invisible. The whole methodology of motion pictures (a series of "still" pictures moving so rapidly that viewers have a sense of continuity) is based upon this human propensity.

There is one drawback to his innovation, Vicary admits. Subliminal advertising can be used only as a reminder to buy simple products already well known to the public—like popcorn. Quick flashes cannot promote items which require complex explanations.

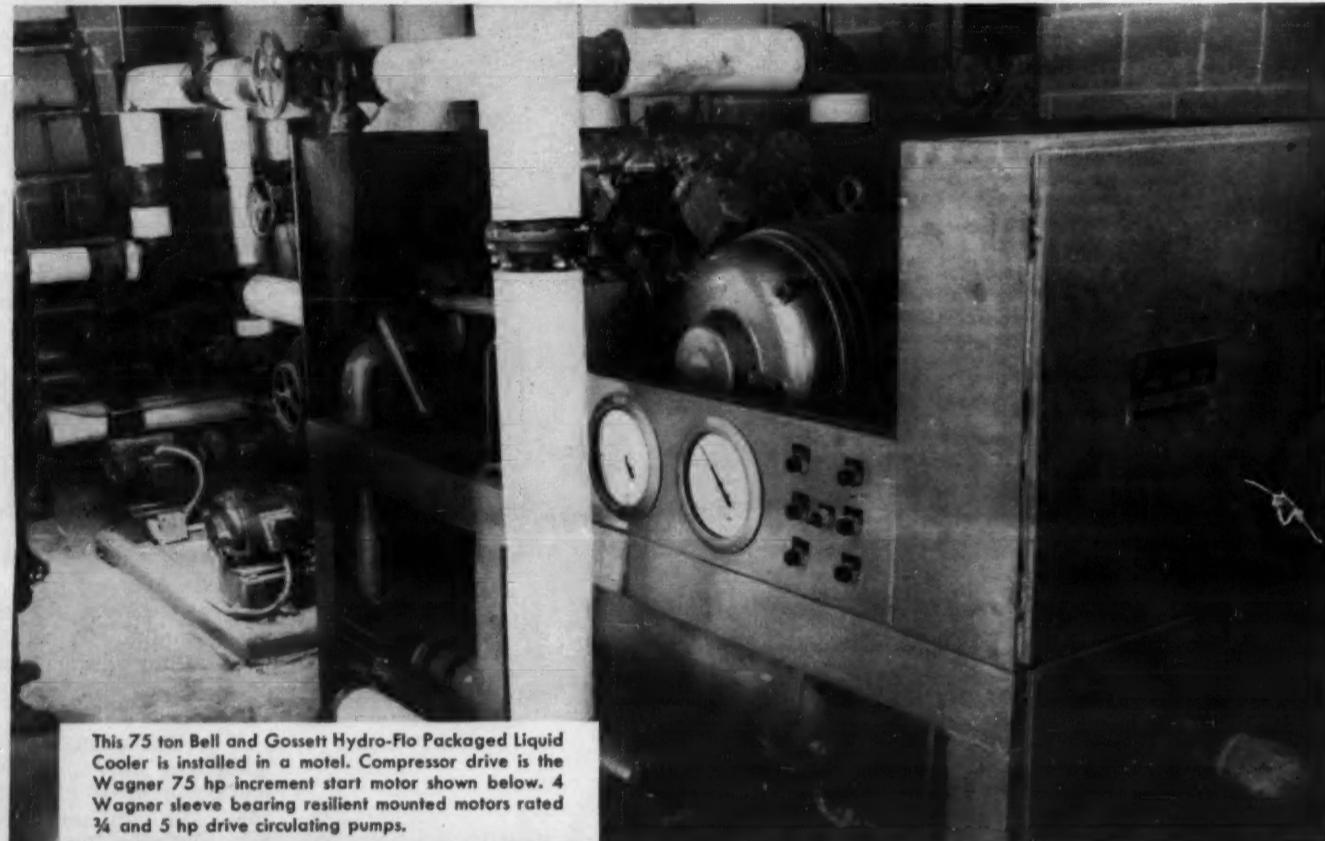
Obviously an advertiser couldn't incorporate a lengthy message (for residential air conditioning, say) into something which slips by in a fraction of a second.

"Dope" hopes he isn't suffering from hardening of the arteries and attitudes.

Nevertheless, this mechanical expression of motivational research strikes us as an unwarranted invasion of privacy, and an assault on personal integrity and freedom of choice.

Something like heady perfume on a designing woman.

WAGNER ELECTRIC MOTORS...THE CHOICE OF LEADERS IN INDUSTRY



This 75 ton Bell and Gossett Hydro-Flo Packaged Liquid Cooler is installed in a motel. Compressor drive is the Wagner 75 hp increment start motor shown below. 4 Wagner sleeve bearing resilient mounted motors rated 1/4 and 5 hp drive circulating pumps.



Wagner two-step combinations suit most applications. For installations where unusually low inrush of starting current is required, Wagner can furnish 3, 4, 5, or 6 step increment motor-starter combinations.



H57-14

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

For more information about products advertised on this page use Information Center, page 12.

Men on the Move . . .

Amana Refrigeration, Inc.—MATT RYAN and MAURIE HULEN have been named regional sales managers for the Buffalo and Syracuse, N. Y. territories, respectively. JAMES GALL, former regional sales manager in Buffalo, has been transferred to Detroit.

National-U. S. Radiator Corp.—ALFRED R. SCARPERI has been named to head sales engineering work on air conditioning in the St. Louis area. He has been an air conditioning engineer at the home office in Johnstown, Pa.

"Freon" Products Div., E. I. du Pont de Nemours & Co., Inc.—A. HICKS LAWRENCE, JR. has been appointed aerosol propellant sales manager, succeeding THOMAS D. JOHNSON, JR., recently designated assistant director of sales for the division. JAMES C. FELDMANN, superintendent of plants technical section of the Antioch, Calif. plant, replaces Lawrence as manager of specialty products sales.

American Potash & Chemical Corp.—CHESTER A. LAWTON, former district representative in the midwestern area, has been named manager of a newly-opened district office at Columbus, Ohio.

Keco Industries, Inc. (Cincinnati)—WILLIAM J. DOWNS has been named vice president-engineering, a promotion from chief engineer.

Insulation Div., Armstrong Cork Co.—JOHN S. TAYLOR, current district manager of the San Francisco office, has been named district manager of the newly-combined Los Angeles and San Francisco offices. MANN C. SWEET of the Los Angeles office will serve as branch manager there, under Taylor's direction. A. B. CALLOW, district manager at Los Angeles, is retiring.

Reading Tube Corp.—Appointment of JOHN STEWART, JR. as acting controller has been announced.

Barry Blower Co.—L. P. HANSON, formerly with United States Air Conditioning Corp., has been appointed sales manager.

Sweden Freezer Mfg. Co.—JACK REITER, previously area manager for the south central area, has been upped to central regional manager.

Mueller Climatrol, Div. of Washington Corp.—WILLIAM S. MALLLOY has been appointed as personnel manager. He formerly was director of personnel relations, plant personnel manager, and insurance manager.

Dunham-Bush, Inc.—RALPH J. TARASCO has joined the export department as assistant to the export sales manager. He formerly was export sales manager of Melchior, Armstrong, Dessau Co., Inc.

Arrow-Hart & Hegeman Electric Co.—POMEROY DAY was elected to the board of this maker of wiring devices and control apparatus.

Trane Co.—TED M. STEPHENS has been assigned to the San Antonio office as sales engineer following a post-graduate engineering course at the home office.

Waukesha Motor Co. (Waukesha, Wis.)—CHARLES E. NELSON,

JR. has been appointed executive vice president; J. GRANT SWAIN, vice president-sales; NEWTON H. WILLIS, vice president-engineering; LEWIS W. YOKER, secretary-treasurer; and JOSEPH J. KLEINBROOK, assistant secretary and assistant treasurer.

Deming Co. (Salem, Ohio)—GLEN R. EVERETT has been named factory sales representative for northeastern Ohio and western Pennsylvania serving distributors and industrial pump users there. He was formerly with the sales department at home factory offices.

Aeme Industries, Inc.—HARRY E. THOMPSON has been appointed a director.

Climate Equipment & Supply Co., Inc. (Rochester, N. Y.)—HARRY IVANUSKA has joined this General Electric Co. heating and air conditioning distributor as a director and vice president responsible for sales and engineering assistance in the area surrounding Rochester.

THOMAS E. KELLY, office and warehouse manager, has been elected secretary; EDMUND A. WELLINGHOFF, previously heating manager of another firm, has joined the sales staff to handle sales in the southeast part of the franchised area. HENRY NEAL will be in charge of expanded branch facilities in Buffalo. O. F. "DICK" FURROW will serve the western end of the territory. GEORGE MORSE continues as sales representative in Buffalo.

Admiral Corp.—EDWARD B. COLLIER has been appointed manager of national accounts. He left the post of key accounts manager at Norge to join Admiral.

Temeo, Inc. (Nashville, Tenn.)—R. E. "BILL" RUTHERFORD has been named mid-south regional sales manager. He has represented Squibb-Taylor Co. of Dallas.

Diehl Mfg. Co. (Somerville, N. J.)—CHARLES B. PICKERING has joined the New England sales staff and will concentrate on sales of integral and fractional horsepower motors with headquarters in Needham, Mass. He has been with

Allen-Bradley Co. in Boston.

Lumm Corp. (Toledo)—JAMES N. SAMPSON, formerly a Cleveland consultant in air conditioning, refrigeration, and ventilating, has been named general manager of the air conditioning and refrigeration contracting division, succeeding ROBERT GREENWALD, resigned.

Tri-State Distributing Corp. (Cincinnati)—ROBERT E. MURRELL, general sales manager, has resigned. RICHARD J. BRENNER, assistant sales manager, succeeds him. The firm is Philco Corp. distributor for 25 counties in Ohio, Indiana, and Kentucky.

Air Conditioning Council of Greater Houston (Texas)—J. R. HOBBS has been elected president; other officers are W. F. FENOGlio, vice president, and COL. L. R. SEXTON, executive secretary.

Plumbing & Heating Div., American Standard—Appointment of ROBERT G. HOLMES as operations manager, Allegheny sales district, has been announced. He has been sales manager in Salt Lake City office. Holmes is succeeded in general sales manager.

that post by JOHN W. WALLACE, JR., formerly a sales representative in the Seattle sales office.

Johnson Service Co. (Milwaukee)—R. J. MURPHY has been elected to the newly-created position of executive vice president. He formerly was vice president-treasurer of the firm. He will continue to serve as treasurer.

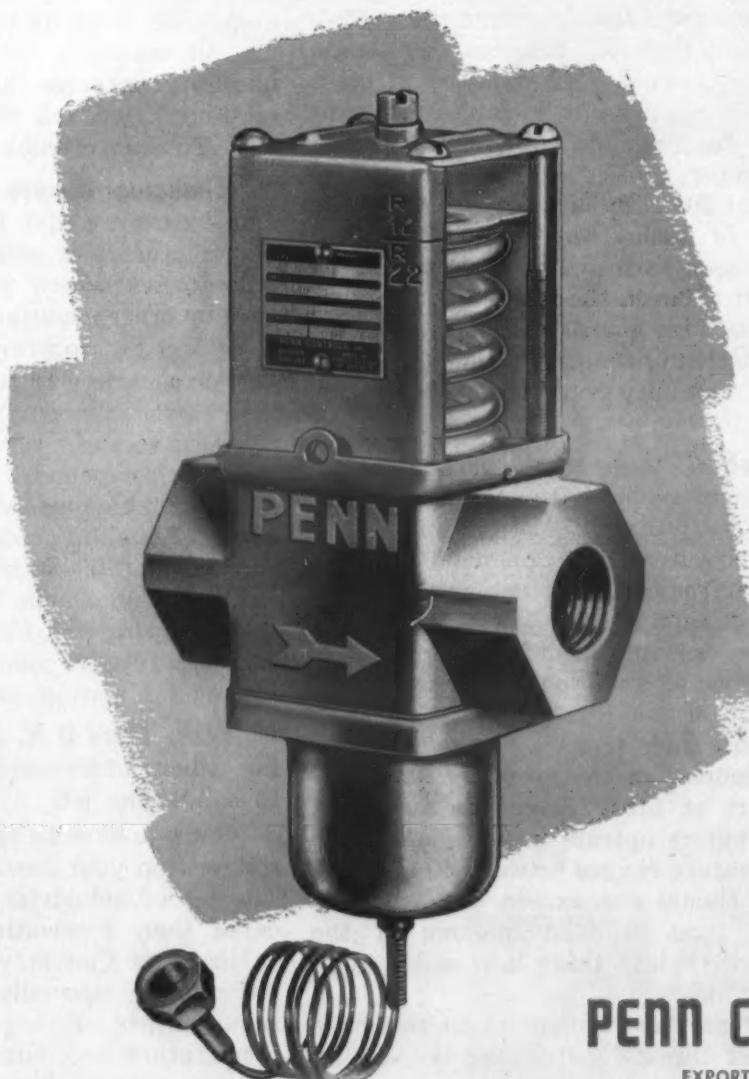
Heating, Piping & Air Conditioning Contractors Association of Cincinnati—ALBERT LEWIS has been chosen executive secretary.

Norge Div., Borg-Warner Corp.—Election of ADOLPH M. KRAUSE as assistant treasurer has been announced. He has been budget operations manager.

Electric Radiant Heat Corp. (Phoenix, Ariz.)—RAY WENDLING has become general sales manager after moving from Los Angeles where he was with General Electric Co. for 20 years.

Eaton Mfg. Co. (Cleveland)—MARTIN D. ARCHANGELI, assistant general manager of Saginaw Div., has been promoted to the newly-created position of general sales manager.

NOW...USE ONLY ONE WATER VALVE FOR BOTH R-12 and R-22



New Penn 246 ALL-RANGE Water Valve

Here is the refrigeration industry's favorite water valve... the Penn 246... in a new ALL-RANGE model making it suitable for both R-12 and R-22 service! Your inventory is reduced yet you'll always have the right model on hand.

And remember, you get the same dependable features that have made Penn 246 water valves stay on the job longer... no valve chatter; no water hammer; no corrosion of sliding parts because water never touches them; easy manual flushing; highly sensitive yet accurate. Available in $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ " sizes.

Don't settle for something "almost as good" . . . specify Penn ALL-RANGE water valves.

Ask your wholesaler or write Penn Controls, Inc.

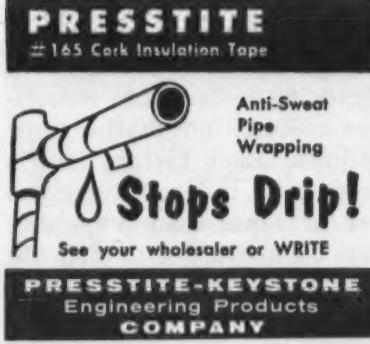
PENN CONTROLS, INC.

Goshen, Indiana

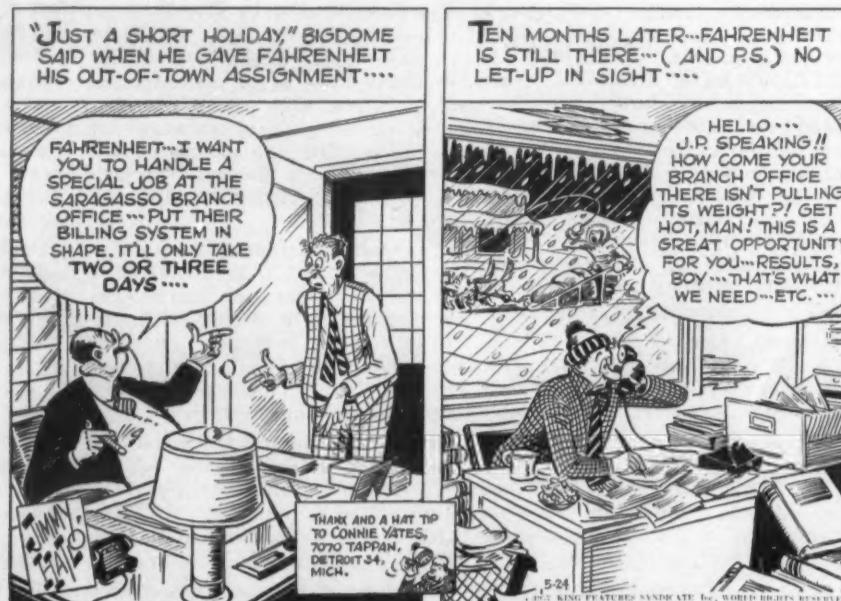
EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.

AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

For more information about products advertised on this page use Information Center, page 12.



They'll
Do It
Every
Time
by
Jimmy
Hatto



Industrial Air Conditioning Grows Interestingly

(Concluded from Page 1)

maintain humidity at a constant 55% the year-round, holding temperature at 70° in winter and 80° in summer. And an industry was born.

Today the upturn is unmistakable in industrial air conditioning sales. Everyone watching the dollars which roll into installers' coffers predicts that factory climate control has begun a growth curve which will achieve remarkable proportions within the next few years. It's already big business—and growing bigger!

R. H. Jones, G-E's air conditioning division general manager, declares that "precise control of indoor factory climate is necessary to make the quality and quantity of products that the ever-growing consumer market requires." Matt Lawler, vice president in charge of Worthington's air conditioning and refrigeration division, states: "Every day, under operating conditions in factories and shops around the country, new uses are being found for air conditioning and refrigeration to aid production, increase efficiency, or cut costs."

Obviously industrial air conditioning is snowballing, and now is the time to hitch your sled to that ever-gathering force as it rolls onward. Here are a few typical application examples:

Control of humidity is required in a chocolate manufacturing plant to prevent tiny drops of dew from appearing on the sweet and discoloring it. Too-high temperatures cause the chocolate to run. Furthermore, employees function more efficiently in air conditioned surroundings.

A dripping 80-85% relative humidity is maintained in rayon plants which the yarn is on the spools. If not, crystals would form on the thread and make it lumpy. Makers of processed foods, electronics, paper, and chemicals would go out of business if they didn't have climate control.

Air Conditioning is an optional necessity in printing firms. On the process side, close control of humidity will eliminate distortion, curling, or buckling of paper, will permit better ink drying procedure, and will curb static electricity generated by paper and machines.

In addition, the use of water-chilling equipment helps provide more accurate positioning of colors in multi-color printing, prevents warping of wood-mounted zinc engravings, and keeps printing machine rollers

from swelling and shrinking during operation.

More examples: Temperature is maintained at about 70° and relative humidity at 80% in the cooling room of the large modern bakery where bread is taken prior to wrapping. The high humidity reduces mold formation and minimizes moisture loss so that the bread won't crumble when cut. In making melba toast, crackers, and other crisp goodies, relative humidity is held at 10% from ingredient storage through processing and packaging, to assure a stable and standardized product.

Air conditioning is essential in synthetic rubber production, moreover. One manufacturer keeps processing temperature at 100° below zero! Another maintains a steady 30° in the reactors where the material polymerizes so the desired reaction will take place.

Climate conditions determine the quality of bullet-proof glass. Because the plastic sandwiched between various layers of glass is extremely sensitive to moisture and temperature, the assembly room must have a steady temperature of 60° and a relative humidity of 20%. Even more delicate is the operation of fusing the two elements of bifocal glasses lenses. Let a minute speck of dust get between the lenses and they are ruined. One firm guards against such damage by not letting the fusing room temperature and humidity vary a single degree from day to day.

Most of all, those mental marvels, electronic computers, need to maintain a cool head. RCA's "Bizmac" in Detroit's Ordnance Tank-Automotive Command contains 96,000 electronic tubes which generate enough heat each hour to warm 30 average-size homes during the most severe winter weather. Without an air conditioning system, these giant brains would get so hot they would "blow their tops."

Air admitted to the machines at 55-65° may depart at 115°. Engineers aver that these computers operate in top shape when the temperature ranges between 60 and 80°. Humidity should not exceed 60% for any length of time. Human masters of the "mechanical brains" think best under those conditions, also.

One of the first industries to recognize the value of climate control was the textiles business. This was the principal reason why early fabricators located along the New England coast. That area had high humidity,

F. M. COCKRELL, Founder

The Conscience of the Industry

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a requisite in weaving textiles. Moist air around cotton, silk, and wool imparts smoothness, strength, and pliability to the thread. Humidity levels in the mills, however, not only vary with various kinds of fiber, but are different in each processing department.

At one North Carolina textile plant, humidity in the carding and spinning rooms is kept around 45% and in the weaving room at about 69%. Reason for the difference is that, in the weaving operation, the fibers have been coated and it takes additional moisture to penetrate and prevent the fiber from breaking during weaving.

So important is climate control in making synthetic fibers, especially nylon, that manufacturers, for competitive reasons, decline to give details.

A "must" in cigarette production is moisture regulation. Tobacco is conditioned as soon as it comes from the hogshead. First it's treated to high temperatures to drive out all moisture, then humidified to desired levels. If humidity gets too high during processing, the tobacco may spoil and will foul up the cigarette-making machinery. Tobacco crumbles if humidity gets too low.

Changing climate conditions cause metal to expand and contract. Said fact is of particular importance to manufacturers of gauges and precision machine parts. In laboratories where master gauges calibrate "jo-blocks" used by other manufacturers the country over, temperature is held at 88° to prevent moisture condensation.

For a variety of reasons, drug manufacturers prescribe their own indoor climates. In the final processing of enzymes (organic substances capable of producing changes in other compounds) temperature is maintained between 45 and 50° because enzymes deteriorate at any temperature above. Penicillin production requires exact air conditioning throughout its entire production cycle, in order that there'll be no change in quality from one batch to another. In the drying and filling room, temperature is a constant 74° and relative humidity 15% lest the dried penicillin packed for storage or shipment go bad.

Well, there it is. It's yours for the asking—this growing industrial air conditioning business—if you're equipped to handle the job.

But you have to be on the ball. That little spheroid will roll you on your head if you aren't equipped to handle it. The job of industrial air conditioning is far more complicated than residential comfort-cooling, no matter how troublesome that may be sometimes. Each factory installation is a specially-engineered job, tailored to given requirements. Either high-than or lower-than prevailing temperature and humidity may be needed, with delicate discriminations. Each installation is a tremendous full-time task by itself.

But what a future it has!

Air Distribution Requirements In Year-Round Air Conditioning

2. Fundamentals of Conditioned Air

Thus far we have dealt with (1) chemical balance, (2) weight, and (3) enthalpy in very general terms. Succeeding discussions in the same generalities will be continued, for experience shows that first becoming broadly familiar with

terms and definitions in the psychrometry of air leads to a better understanding later of the technical details that follow.

Under chemical balance we have more or less investigated the basic "primer" knowledge of air composition as to the elements involved. Under both Enthalpy and Weight we have tentatively investigated (1) Heat, including Sensible and Latent Heat, (2) Total Heat, and (3) primary information bringing about volumetric changes in atmospheres due to temperature changes. There are yet additional factors and applicable information that should be in our review of temperature relationships in atmospheres.

Explains Terms

In the previous formulae, explaining the characteristic mathematical solution of volumetric changes in atmospheres at constant pressures when influenced by temperature, the terms "Absolute Zero" and "Absolute Temperature" were used. Before going further these should be explained.

Absolute temperature means exactly what it sounds like; it is the temperature observed above *absolute zero*. Theoretically in the branches of physics and chemistry involved, *absolute zero* is the lowest possible temperature that can be obtained; it is that temperature where no kinetic energy is present. Lack of kinetic energy would indicate therefore that no molecular activity or movement was involved. Thus a gas or any substance at such a temperature would be in a physically inactive or suspended state.

When Gas Is at Absolute Zero

Inasmuch as we have observed that a gas at various temperatures exerts pressure (thus bringing about a change in volume), and that this exertion of pressure is due to molecular activity and movement or vibration of and within its structure, it can therefore be assumed that when such a gas is no longer in an active state, where kinetic energy is present, it is incapable of exerting pressure. If it is incapable of exerting pressure and changing volume, it is incapable of temperature and must then be at absolute zero.

For example when a perfectly balanced gas is completely confined in an area such as in a vessel of some kind at 0° C., and the temperature, or its temperature is lowered 1.0° C., its pressure will register $\frac{1}{273}$ of its original pressure at 0° C. At this point in the absence of all heat, there would be no temperature and the gas is assumed to be at Zero on the Absolute Scale. Water then would freeze

at 273° C. Absolute and its atmospheric boiling temperature would be 383° C. For a comparison to temperature scales more familiar, Absolute Zero is 492° F. below 32° F. Thus 0° F. is equivalent to 460° F. Absolute.

In previous paragraphs there was a brief discussion of the volumetric changes in gases or atmospheres. This change was identified by a Temperature-Volume relationship. Cited was a typical ratio of change between volume and temperatures of 0° F. and 100° F. Following are some additional examples of volumetric changes due to temperature.

Once again in the following remember that the pressure remains constant for the examples, and for the purpose of the examples let us use *dry air* (air containing no water vapor). Furthermore let us use Atmospheric Pressure as our constant for the pressure involved.

Relationship of Temperature, Volume

Example 1: 1,000 cu. ft. of dry air at 32° F. when cooled to 0° F. will shrink to 935 cu. ft.

Example 2: 1,000 cu. ft. of dry air heated to 70° F. will expand to 1,078 cu. ft.

Example 3: 1,000 cu. ft. of dry air heated to 100° F. will expand to 1,139 cu. ft.

Frank Klein has been associated with the air conditioning and refrigeration industry for over 20 years. An engineering graduate of the University of Michigan, he has held executive positions with a number of leading manufacturers, and has served as a consultant to both manufacturing and distributing firms, in the heating as well as the cooling field.

This is the second in a series of articles.

In these examples can be seen a relatively short time. Thus we must understand the graphic relationship of Temperature to Volume. As a result of this relationship of temperature to volume in atmospheres, it is important that such relationship be both understood and applied in our own knowledge of the fundamentals of Conditioned Air, for the practical aspects of this relationship and the values involved become obvious when such Conditioned Air is handled and distributed.

In the foregoing examples atmospheric pressure was used as the constant for the expansion and contraction of atmospheres of dry air at varying temperatures. It is important therefore that we understand what atmospheric pressure is. Atmospheric pressure may be defined as that pressure which is exerted by the atmosphere of the Earth at and above sea level. At sea level this pressure is about 14.7 lbs/sq/in.

(To Be Continued)

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Specify Quality-Controlled PHELPS DODGE COPPER TUBE!

- All tempers and sizes for use in original equipment.
- Straight length tube tempered to meet your bending and expanding specifications.
- Quality-controlled throughout manufacture to assure finest tube properties.
- Tubes degreased and capped, or dehydrated and sealed, if required.
- Deliveries geared to your production requirements.

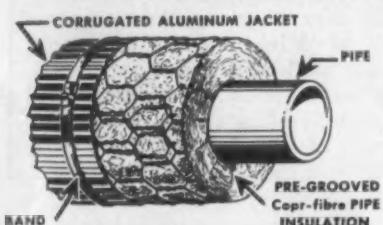
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from Mine to Market!



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Develops Segmental Laced-On Pipe Covering



KEY NO. G-1140

AURORA, Ill.—A new segmental laced-on pipe covering insulation is offered by 48 Insulations, Inc.

The new product, called "Copper-fiber Lace-On" pipe covering, is a felted mineral insulation which gives a one-piece application at minimum first in-place cost. It is reinforced with a metal mesh facing which is horizontally laced together around the pipe, requiring no extra wire, the company said.

Insulation is pre-grooved on the inside surface which allows an easy wrap and a tight fit around the pipe.

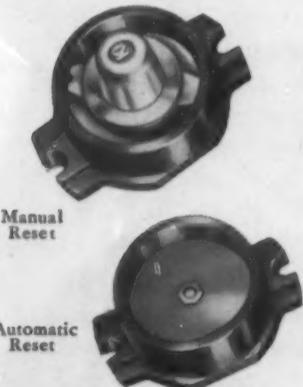


Only minor repairs necessary on Klixon Protected Motors ... says refrigeration service shop

BUFFALO, NEW YORK: The Electric Refrigeration Motor Service has been servicing refrigerators and refrigeration equipment for over 21 years and, based on this experience, Earl G. Benz, Manager and Partner, has this to say about Klixon motor protectors:

"On appliances with Klixon Motor Protectors we have found very few burned out motors, saving breakdown time for the user. Usually, only minor repairs were necessary on these appliances, thereby saving the customer added expense."

Klixon Protectors reduce service calls and repairs by preventing motor burnouts.

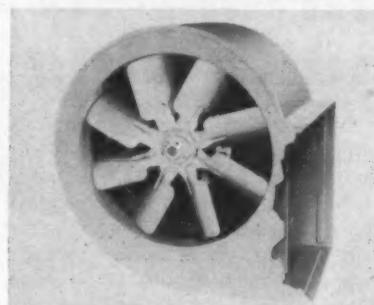


The Klixon Protector is built into the motor by the motor manufacturer. In such equipment as refrigerators, oil burners, washing machines, etc., they keep motors working by preventing burnouts. If you would like increased customer-preference, reduced service calls and minimized repairs and replacements, it will pay you well to ask for equipment with Klixon Protectors.

Write for the new free informative booklet, "THE STORY OF THE SPENCER DISC."

METALS & CONTROLS CORPORATION
Spencer Thermostat Division 2411 Forest Street, Attleboro, Mass.
KLIXON

Announces 'Radiax' Blower In Four Models

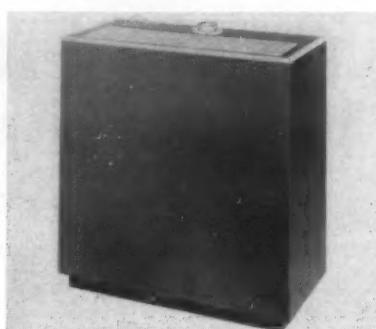


KEY NO. G-1141

TORRINGTON, Conn.—The "Radiax" blower recently announced by Torrington Mfg. Co., is a symmetrically constructed

direct-drive unit with power and pressure characteristics suited for furnace and air conditioner applications. Radiax is offered in four models covering a flow range from 500 to 1,500 c.f.m. against typical back pressures.

It is claimed to have non-overloading power characteristic—a flat power curve permits the impellers to run at any operating point with the same motor and the motor need not be changed for operation in another system. Also it is said to have a higher operating efficiency when applied in warm-air furnace or air conditioning applications.



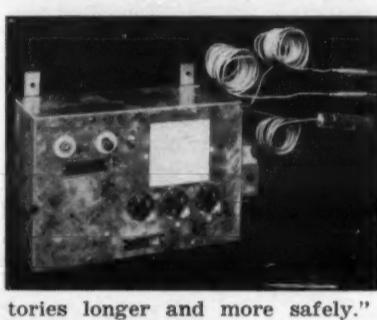
Humidifiers Have 'New Concept'

KEY NO. G-1145

ALBION, Mich.—An entirely new concept in humidifiers for the home has been added to the Coolerator line of air conditioners and dehumidifiers, according to the manufacturer, Lonergan Coolerator Div., McGraw-Edison Co.

Known as model HD100, it features both automatic humidity control and portability. The humidistat controls the on-off operation. It can be set for the desired humidity condition.

Also featured is the 7-gal. capacity which is large enough to serve the entire living area without frequent refilling. A wick-type wet filter removes dust and pollen particles from the air, and eliminates objectionable odors.



Offers Auxiliary Control for Commercial Cases

KEY NO. G-1142

CHICAGO—The Bossman Controls Co.'s new control is an auxiliary unit installed on commercial refrigerators to insure safer food storage. It enables colder temperatures and higher humidity conditions with automatically controlled frost-free drain pans and coils.

On refrigeration systems (that have needed capacity) you can dial temperatures down to 28-32° F. to "store valuable perishable inventories longer and more safely."



Has Power Drive for Hand Pipe Tools

KEY NO. G-1143

WICKLIFFE, Ohio—A new, lightweight power drive for hand pipe tools has just been introduced by the Oster Mfg. Co. here.

One of the biggest features of the Oster "100" is claimed to be its low cost.

The 100 has a full 2-in. standard pipe range and up to 12-in. diameters using a special drive unit and geared tools. The machine can be mounted in a variety of ways to fit every need. In addition to the hinged, folding stand, it can be bolted directly to work bench or clamped on a mounting.



Introduces 5/8-In. Check Valve

KEY NO. G-1144

HIALEAH, Fla.—Watsco, Inc. has now added a new 5/8 in. size to the "Magni-Chek" valve line.

It is a check valve with no springs, therefore no back pressure. A small floating disc controlled by a life time alnico magnet does all the work.

Secondly, the T-S (thread solder) connection, which is a standard male flare fitting with removable inserts for flare or solder or combination of both, offers versatility of installation with no additional parts needed.



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BASIC CHEMISTRY

(As Applied In Refrigeration)

Part 2—Hydrocarbons and Oils

By Frank J. Versagi

When we think of oil in a refrigerating unit, we think of wax and sludge; sometimes we think of moisture and acid formation.

Wax has caused perhaps as many "freezeups" as ice, for the effect of wax at the control is the same as that of ice. In addition, deposits of wax on tubing walls can have an adverse effect on heat transfer and the efficiency of the unit. In the days before modern refining techniques were available, wax was a very common problem with refrigerating oils; today, it is much less a problem.

All lubricating oils contain some wax. Paraffin base oils contain a great deal more than naphthenic oils. This fact accounts for one of the practical rules in using oils in refrigeration; naphthenic oils are generally preferred for low temperature units.

Always Some Oil Traveling with 'Freon'

The "Freon" type refrigerants are at least partially miscible with oil in the liquid state. This means that there will always be some oil traveling with the refrigerant throughout the unit. Any wax in the oil will remain dissolved or liquid at the compressor and receiver temperatures. But when the wax hits the low temperatures of the evaporator coils, it will tend to separate out and deposit on the walls or even as far back as the control.

To determine the suitability of an oil from the wax standpoint, tests are run in the laboratory to determine at what temperatures any wax present will separate from the oil. This temperature at which wax separates is called the *floc point* of the oil.

While refrigeration grade oils

are dewaxed as part of their manufacture, all oils will contain some small amount of wax. An oil intended for low temperature work can have a floc point as low as -100° F.

It is unavoidable, and most often desirable, that some oil should travel with the refrigerant. However, the amount is important. Authoritative sources quote the figure of 1 to 2% oil in the liquid stream. The amount of oil should never exceed 10%.

If an older unit tends to pass more oil than this, the unit should be repaired or an oil separator should be installed. Even if wax is not a problem, such a great amount of oil will reduce the efficiency of the unit and may collect in fittings and restrict the flow of refrigerant or slug back to the compressor causing damage.

Refrigerants Are Good Solvents

It is possible for wax to reach the evaporator or control even if very little oil is circulating through the system. The refrigerants are good solvents. If any wax is in the oil, they can dissolve it out of the oil and into themselves. The wax will stay in solution until it reaches a low temperature area where it will separate due both to temperature drop and to evaporation of the refrigerant in which it is dissolved.

While wax may be part of the sludge formed when oil decomposes, the term sludge is more generally applied to all the undesirable solid and semi-solid substances which appear when the oil breaks down.

Thus, a sludge can contain wax, resin, oil, carbon, dirt, metallic particles—in any combination. The action which takes place during oil breakdown is only partially understood, but there are several well known basic chemical reactions which apply and help visualize what occurs when sludge forms.

If we had to choose the major enemy of oil in a unit, we would pick oxygen or air. Oxygen is as harmful to oil as moisture is to refrigerants. When only slight oxidation has taken place, the oil may be only slightly discolored rather than broken down into a sludge. To understand the process of oxidation, we can look at the simple process of burning. Burning is oxidation—complete oxidation. When an oil or any hydrocarbon burns or oxidizes completely, water and carbon dioxide are formed. The reaction is the same for all simple hydrocarbons.

Thus:
Methane plus Oxygen equals
Carbon Dioxide plus Water
 $CH_4 + 2O_2 = CO_2 + 2H_2O$
In the case of a heavier hydrocarbon:
 $2C_{20}H_{42} + 61O_2 = 40CO_2 + 42H_2O$

Except for the actual number of particles taking part, these two reactions are identical.

Now, if this reaction occurs to any degree within a unit, we are not only destroying the oil, but forming water which will cause trouble with the refrigerant. In a unit, of course, there is never enough oxygen or air to allow complete oxidation like this. In this case, the reaction is slightly different—more like what happens when oily rags burn without access to air—generating soot and smoke. Hydrocarbon plus Insufficient Air equals Carbon Dioxide plus Carbon Monoxide plus Water plus Free Carbon
 $C_{20}H_{42} + O_2 = CO_2 + CO + H_2O + C$

This free carbon would mix with the clear oil and discolor it.

Oxidation Is Simplest Chemical Reaction of Oil

Oxidation is the simplest type of chemical reaction in which the oil will take part. Other, more complex reactions may generate mild hydrocarbon-type acids and resins. These reactions are too complex for discussion here, but it should be pointed out that the mild hydrocarbon acids mentioned are nothing like the hydrochloric acid which can be generated when refrigerants break down.

There is no possibility of generating hydrochloric or hydrofluoric acid from oil alone.

This is an important point to remember because it is often loosely stated that *acid* can be generated by oils. Just keep in mind that this acid is a mild organic-type which will not generally attack metals in the unit.

In fact, most oils as they are supplied possess a very mild organic acidity—completely harmless compared to similar small amounts of the mineral acids like hydrochloric and hydrofluoric. (One group of authorities theorize that the mild organic acids may contribute to copper plating.)

Under operating conditions, when the lubricating oil and refrigerant are well mixed, there is a greater tendency for the refrigerant to break down than when it is not mixed with oil. But in this case the acids come from the refrigerants, not from the oil, and we shall discuss this reaction in a later article when we study the structure of refrigerants.

From all this we can see that if an air leak occurs on a system, oxidation can occur with the continuous formation of carbonaceous matter, or resins, or solid matter of the type we



EXPERIMENT showing how oil reacts to introduction of oxygen or nitrogen.

classify under the general term "sludge."

Even with no oxygen present, hydrocarbons will undergo thermal decomposition or breakdown at high temperatures. In this case, the hydrocarbons usually break down into smaller molecules. For example:



This again is a complete breakdown. If the breakdown is partial, this type of reaction can also produce carbon and sludge. In the laboratory this type of breakdown will not begin until the temperature reaches about 550° F. In the presence of metals, however, the temperature is reduced significantly.

In a system, of course, the oil is continually in contact with metal. Further, even though the main body of oil is kept at a moderate temperature, it is possible for this type of breakdown to take place at hot spots such as might occur at bearings.

And high temperatures will increase the rate of any oxidation taking place, should there be air in the unit. In open-type units, the oil temperatures seldom exceed 120° F.; in hermetic units the temperature may reach 225° F. under severe operating conditions.

Know Operating Characteristics

Knowing the operating characteristics of the unit can be a help in choosing the right oil to use. For example, if a unit is known to have high operating temperatures, it is wise to use paraffin-base oils to which have been added oxidation inhibitors or retarders.

Naphthenic oils tend to break down in contact with additives of this type, and even without the additives they tend to be less stable under severe operating conditions. Naturally, inhibited oils cost more than the common oils; only the serviceman can determine whether the conditions warrant their use.

(To Be Continued)

Union Carbide Appoints Benedict To Supervise Chemicals, Plastics Work

NEW YORK CITY—D. B. Benedict has been elected a vice president of Union Carbide Corp., it was announced by Morse G. Dial, president.

Benedict has been president of Union Carbide Chemicals Co., division of the corporation. In his new position he will be responsible for the corporation's chemicals and plastics activities.

Dial also announced the appointment of E. E. Fogle as president of Union Carbide Chemicals Co. and of H. D. Kinsey as president of the newly-formed Union Carbide Olefins Co., also a division of the corporation. The Olefins company will handle the production and sale of ethylene, propylene, butadiene, and other hydrocarbon products.

Fogle became associated with Union Carbide in 1930 as a research fellow for the Chemicals Co. at Mellon Institute. The following year he came to New York as a technical representative for the company and after that held sales posts in Washington, Albany, Cleveland, and Chicago. In 1954 he was appointed vice president.



LARKIN HALF-TURRET HUMI-TEMP

Efficient operation makes a product easier to sell on one hand; builds solid customer satisfaction on the other. Precision engineering, only the best materials, skilled craftsmanship, and over 25 years' experience in commercial and industrial refrigeration add up to higher efficiency for every Larkin product. And this means lower operating costs—important to buyer and seller alike.

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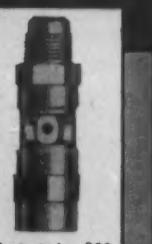
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For more information about products advertised on this page use Information Center, page 12.

What's Going On in Commercial Refrigeration

News of Markets, Products, Methods

He Hopes for Refrigerated Cart To Chill Food from Freezer to Checkout

WORCESTER, Mass.—A tiny shopping-cart refrigerator to keep frozen food frozen on its trip from freezer to checkout station was termed a necessary addition in the near future to the modern supermarket, by Armand A. LaChance, president-treasurer of American Metal Products, Inc., cart manufacturer here.

Concerned about the ever-increasing size of supers, LaChance said, "We wonder whether [the customer's] frozen foods will thaw by the time she gets

to a checkout station." He added: "We are hoping somebody will develop a tiny refrigerator that can be adapted to our carriage."

"We are keeping in touch with automatic refrigerator makers on the idea."

Glenn Price Dies

Glenn Price, owner and operator of Price Refrigeration Co. and the Lamplighter Shop in Ashland, Ky., died recently of a heart attack. He was 52.

National Refrigerator Sales To Operate Shirar-Young Div. in San Francisco Area

SAN FRANCISCO—Charles L. Walling, president of National Refrigeration Sales of Los Angeles, Inc., has announced purchase of the name and goodwill, fixtures, repair parts, and trucks of Shirar-Young Refrigeration Corp. from the trustee of the creditors' committee.

Walling said the long-established San Francisco firm will operate as the Shirar-Young Div., National Refrigeration Sales, and use the same staff.

MOVES TO NEW LOCATION

Larry K. Brink, Sr., secretary-treasurer of National, said Shirar-Young Div. has moved to a new location in San Francisco at 1161 Post St., San Francisco 9, just half a block from Van Ness Ave., and 3½ blocks from the former location.

Shirar-Young operates in the fields of commercial refrigeration, air conditioning, domestic appliances, and services. It formerly had a number of branches

in the bay area.

National does not contemplate branches. It plans expansion of Shirar-Young Div. to cover the entire bay area.

Walling, a veteran of 33 years in refrigeration, represents the Pacific coast on the board of directors of the National Refrigeration & Air Conditioning Contractors Association.

Both Walling and Brink have served RACCA of Southern California as president.

Long established in Los Angeles, National three years ago established subsidiary National Refrigeration Sales of San Diego, Weber distributor there.

MOVES SUBSIDIARY

In August, 1957, National moved subsidiary Pierson Cabinet Co. from Santa Ana, Calif., to the City Refrigerator Co. plant in Los Angeles, having acquired substantial interests in City Refrigerator Co., manufacturer of store fixtures.

Plans are to market and manufacture under the trade name City-Built National, complete market fixtures to west coast and western states areas.

Expansion to the national market is expected to follow shortly, Walling said.

Victory Metal Opens Research Laboratory

PLYMOUTH MEETING, Pa.—A new and modern research laboratory has been completed for Victory Metal Mfg. Corp., it was announced by A. Raymond, president.

The laboratory is adjacent to the modern \$1,000,000 plant built two years ago which manufactures the "Vimco," "Sta-Kold," and "Sno-Queen" line of refrigerators.

The new laboratory has been constructed for use in the engineering, experimentation with, and designing of new refrigerator models "necessary to keep abreast of the ever-changing commercial refrigeration requirements," it was pointed out. In the new structure it is possible to simulate climatic conditions to meet any refrigeration demand, the company said.

U.S. Plans Anti-Trust Probe Of Frozen Food Industry

NEW YORK CITY—It was learned that an anti-trust investigation of the frozen food industry will be conducted by a grand jury in Federal Court here.

Dept. of Justice Anti-Trust Div. officials refused to comment on the probe. Trade associations and various firms have been subpoenaed to appear for questioning. Among these were National Frozen Food Distributors Association, Eastern Frozen Food Association, and Frozen Food Distributors of Greater New York, it was reported.

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And the easier it is, the faster she buys, the more she buys! Tyler-pioneered 33" no-glass, open-front Sales-Cases enable shopper to reach naturally and with ease for speedy access to every item on display. No excessive reflections or glare to interfere with display visibility... packages are easier to see, easier to read; encourages impulse purchases!

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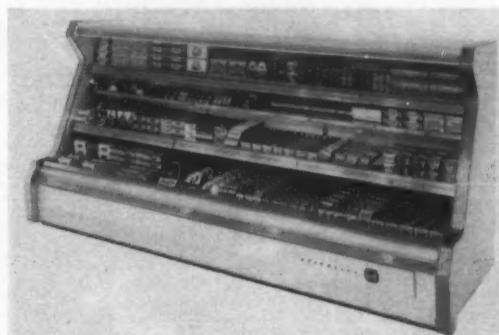
Canada: Tyler Refrigerators, 732 Spadina Ave., Toronto, Ontario (Export: Tyler Refrigeration International, C.A., Apartado Postal 9262, Caracas, Venezuela, S. Amer.)

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ADDRESS _____



For more information about products advertised on this page use Information Center, page 12.



BRAND-NEW "Crestline" series of self-service refrigerators has been introduced by Friedrich Refrigerators, Inc. It features 19 color finishes.

Offers Low-Front Self-Service Cases In 19 Color Finishes for Diamond Jubilee

SAN ANTONIO, Texas—A brand-new line of self-service refrigerators was introduced to the trade at the recent National Association of Food Chains' convention when Friedrich Refrigerators, Inc. here unveiled its 75th anniversary "Crestline" series.

Announcement of the new line, which includes cases designed for all phases of refrigerated food merchandising, was timed to coincide with Friedrich's 75th anniversary, it was pointed out.

"The Crestline series features 19 color finishes, with every type of case available in every color," the company said. "To prepare for future store re-

decoration, front panels are changeable. The large capacity refrigerators are trimmed with stainless steel and polished aluminum.

"Other highlights are a low 36-in. front case height, stainless steel bumper rails, the exclusive Friedrich 'Floating Air' refrigeration system, uni-rib cypress frames, a die-formed gutter in the case's aluminum bottom, and all adjustable shelving."

Each of the Crestline cases will be available in full 8 and 12-ft. inside lengths and a variety of 54½ and 70-in. mirror and non-refrigerated shelf superstructures. Either all-metal or metal and glass fronts will be available on frozen food, meat, and dairy refrigerators. Anodized gold price tag moulding and gold Mylar trim accent Friedrich's modern styling, the company said.

The Friedrich factory, "which in 75 years has grown from a tiny one-man operation on a San Antonio side street to a vast plant covering 20 acres," is in full production on the new line of commercial refrigerators, it was announced.

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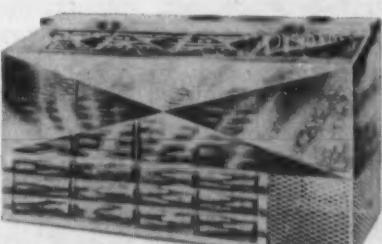
DRINKMASTER

STAINLESS STEEL
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United Frigulator Engrs.
MENOMINEE, MICH.

AVAILABLE IN SIZES 4 to 10 FT.



Rollabout 'Index Platform' Shows Whereabouts of Chilled Beer In 6-Door Display Refrigerator

DENVER—Here's a clever stunt for increasing the selling efficiency of a display refrigerator devoted to chilled beer, as developed by Ray Pinello, owner of Doc's Liquors in a Denver suburb.

Pinello found customers "falling over each other" on hot summer days, in the rush to serve themselves from his 6-door Federal reach-in refrigerator, installed in the right rear corner of the store.

With clerks busy ringing up sales and bagging purchases, many customers had a hard time getting information as to brands, prices, etc. There were instances in which customers walked out rather than wait for busy clerks to give service.

ANSWERS QUESTIONS IN ADVANCE

What was needed, Pinello reasoned, was some practical system of "answering the beer customer's questions in advance" as to brands, price, physical location in the refrigerator, etc.

That was the reason for the "index platform," which is a section of 1 by 8-in. pine planking, mounted on six casters, which rests on the floor immediately below the refrigerator doors.

The plank has space for 20 carry-out beer cartons plus 20 6 by 8-in. white cardboard signs. The signs identify all of the brands offered by Doc's Liquors as well as price per can, per carry-out carton, and per case. They also give the approximate location of the brand in the shelving of the refrigerator above.

Thus, when a customer comes in search of a particular beer, he simply glances along the "index board" where he can either recognize the name from the printed sign or through the open ends of the carry out cartons set on a surface.

BEER FOUND BEHIND SIGN

All of the price information is right there and the beer itself can generally be found directly above on the refrigerator shelves. Since this simple system went into effect, the store is averaging the sale of between 450 and 500 cases of beer per week, 95% of it sold on "self-service" and paid for at a convenient cash register, adjacent to the display. "We haven't



created any extra market for beer," Pinello said, "all we have done is to take all of the stumbling blocks out of the sales picture."

DISPLAY refrigerator devoted to chilled beer is used by Ray Pinello of Doc's Liquors in Denver. "Index platform" in front shows customers where brands are located, how much they cost.

Sherer-Gillett Names B.K. Hopkins, K.F. Packard

MARSHALL, Mich.—Promotion of Ben K. Hopkins to quality control manager at Sherer-Gillett Co. has been announced by President John H. Coolidge.

In addition, appointment of Keith F. Packard as Chicago zone sales manager for the company was announced by John S. Twist, vice president in charge of sales.

Since joining the refrigeration organization in 1936, Hopkins has had a variety of positions, including serviceman, laboratory assistant, and service manager. Most recently, as a laboratory technician, Hopkins' duties have been centered around the development of the new 1958 line of supermarket refrigerators, manufactured by Sherer-Gillett.

Hopkins left the company briefly to enter private business as an electrical and refrigeration contractor in Marshall. During this period he also served a group of National Tea Co. supermarkets as a refrigeration service supervisor. He re-joined Sherer-Gillett in 1956.

Packard comes to the refrigeration company with a wide background in retail food equipment, it was pointed out. Most recently, he worked with Weber Showcase as a factory representative.

The new zone sales manager spent four years in the U. S. Army, two of them in the South Pacific theatre.

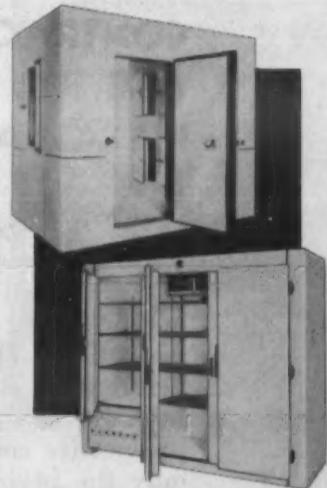
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No doubt about it, the News will carry your sales story to contractor-dealers who sell the bulk of the room air conditioners every year.

These are well established dealers who have sold and will continue to

sell to the apartment houses, motels, hospitals . . . to the barber and beauty shops . . . to the doctors' and dentists' offices . . . and to the banks, stores, and office buildings in their many communities.

Any way you add it up, **AIR CONDITIONING & REFRIGERATION NEWS** is your key to ever-increasing room air conditioner sales in an ever-expanding market—and at a surprisingly low cost to you. For a solid sales foundation tomorrow, advertise now in the News! Do the first job where the first job is being done!

AIR CONDITIONING & REFRIGERATION

The Newspaper of the Industry

NEWS

The Newspaper That Carries More Advertising By Far Than Any Other Publication In The Field.



450 West Fort Street, Detroit 26, Michigan

NEW YORK, 521 Fifth Ave., MURRAY Hill 2-1928-9, Robert M. Price.
CHICAGO, 134 S. LaSalle St., FRANKLIN 2-8093, Allen Schildhammer.
DETROIT, 450 West Fort St., WOODWARD 2-0924, J. B. Sullivan.
LOS ANGELES, 4710 Crenshaw Blvd., AXminster 2-9501, Justin Hannon.

Hotpoint Ups Factory Appliance Prices 3%

NEW YORK CITY—Hotpoint Co., a division of General Electric Co., has raised factory prices of 1958 home appliances an average of 3%, John C. Sharp, president and general manager, announced at a press conference here.

Sharp said the increase was necessary due to high labor and materials costs. While previewing the new line here, he added that "I anticipate another price rise some time after the first of the year." He explained that this would also be the result of still-rising costs.

Hotpoint's business currently is below a year ago, Sharp indicated, but did not disclose the amount of sales decline.

Clemens Dies--

(Concluded from Page 1, Col. 2) dead by the hotel physician minutes later.

A. B. Biddle, executive vice president of Hussmann, and C. E. Hall, general sales manager for regional accounts, Clemens's immediate superior, were present at the time and took charge of the situation.

Clemens had been with Hussmann for the past 11 years. During the last six, he had been assistant general sales manager. Before that he was Ohio divisional manager.

He leaves a wife, Louise, daughter, Lisa, and two sons, Bruce and Roy. They reside in St. Louis.

Clemens had been an associate member of NCRSA and had participated frequently in association affairs. He belonged to the "EMGAM" club which actively sought new members for the group.

Most Cooling Units Are Set for 76°--

(Concluded from Page 1, Col. 3) older the installation, the greater the tendency for lower thermostat settings, Mueller stated.

Conducted under guidance of George M. Hase, Mueller sales engineering manager, the survey was held to learn first-hand how air conditioning owners operate their equipment, to determine average indoor temperatures desired, and to determine if operating habits differ in various sections of the U.S.

Recipients of the 1,760 questionnaires mailed were selected from warranty files and were considered to be a representative sample of Mueller Climatrol air conditioning owners, the company said. Queries were sent to both air and water-cooled equipment owners of units ranging in size from 2 to 7½ hp.

Results indicate that one of three air conditioning users alter thermostat settings when outside temperatures change. More than two-thirds of those answering let the thermostat operate the air conditioner automatically throughout the cooling season. However, the company deems it significant that 29% wait until the house becomes warm before starting the conditioner manually.

Although it is general knowledge, Mueller says, that closed windows and doors improve op-

Compressor Shipments 'Increase Sharply' Forms Heating, Cooling Mfg. Firm-- In 1, 2 Hp., Auto Categories, ARI Says

WASHINGTON, D. C.—Manufacturers' shipments of compressor bodies during the first eight months of 1957 were 14% below comparable shipments during the same period of 1956, Geo. S. Jones, Jr., managing director of the Air-Conditioning & Refrigeration Institute reports.

While the over-all total of shipments was below last year, sharp increases continued to be apparent in 1 and 2-hp. categories as well as compressors designed for automotive air conditioning, it was noted.

The figures are based on reports to ARI from companies whose output of compressor bodies is estimated to represent more than 95% of total U.S. production. They do not include shipments of bodies produced for use in household refrigerators.

Shipments of 2-hp. bodies jumped from 59,484 in the eight-month period of 1956 to 184,548 in the comparable period of 1957; the figures for 1-hp. units rose from 593,954 last year to 768,880 in the same eight months of 1957. The gain in shipments of automotive-type bodies was from 205,710 the first eight months of 1956 to 366,204 in 1957.

Most of the losses were in fractional-horsepower bodies.

Total shipments for eight months this year were 3,146,987 bodies, compared with 3,513,163 in 1956. August shipments of all categories were 147,496 units this year, against 336,934 last year.

The 1957 figures, along with the names of the reporting com-

panies, are shown in the following tabulation.

MANUFACTURERS' SHIPMENTS OF COMPRESSOR BODIES

(Except for household refrigerators)

Horsepower*	Shipments Including Exports	
	Aug., 1957	Jan.-Aug., 1957
1/2 & under	24,051	317,189
1/4	49,392	534,642
1/2	17,436	167,879
1/4	6,422	73,865
5/8	5,264	341,193
1	8,047	768,880
1 1/2	3,610	198,754
2	5,497	184,548
3	4,322	79,350
5	3,144	58,878
7 1/2	2,083	35,591
10	404	8,267
15	242	2,623
20	174	1,653
25	134	1,357
30 & over	520	5,071
Total	130,742	2,779,740
For Ammonia Refrigerant—		
Total	130	1,043
For Automotive Air Conditioning—Total	16,624	366,204
Grand Total	147,496	3,146,987

*For all refrigerants except ammonia (excluding units for automotive air conditioning).

Reporting companies: Airtemp Div., Chrysler Corp.; Bendix-Westinghouse Automotive Airbrake Co.; Brunner Div., The, Dunham-Bush, Inc.; Carrier Corp.; Copeland Refrigeration Corp.; Curtis Mfg. Co., Refrigeration Div.; Frick Co., Inc.; Frigidaire Div.; General Motors Corp.; General Electric Corp.; Kelvinator Div., American Motors Corp.; Lehigh, Inc.; Tecumseh Products Co.; Trane Co., The; Vilter Mfg. Co.; Westinghouse Electric Corp.; Worthington Corp.; York Div., Warner Corp.

This summary includes all compressor bodies shipped by the reporting companies regardless of whether they were shipped separately or incorporated into a condensing unit or unitary end-use product (such as a room air conditioner, display case, freezer, or commercial refrigerator). Shipments for export are included. Shipments for household refrigerators are not included.

In order to avoid duplication of reporting, shipment figures were requested only from companies that assembled the machined compressor casting with the components necessary to make a complete compressor or motor-compressor assembly.

LOS ANGELES — Ben B. Breslow, president of Utility Appliance Corp., and Mission

Appliance Corp., announced the appointment of P. L. (Pete) Chabre as national sales promotion manager of Utility and Mission, its affiliate.

Breslow said Chabre will also continue as sales manager of Utility's Gaffers & Sattler and Occidental range divisions.

Chabre joined Utility in 1936. He served with the U. S. Army in both World War II and the Korean War and was discharged with the rank of major after a field promotion.

Appointment of Walter Schiel as controller of Utility Appliance and its Gaffers & Sattler Div. was announced by Harry H. A. Goldman, chairman of the board and treasurer. He succeeds Leonard Vorhoeis.

Schiel was for years associated with accounting departments of leading U.S. corporations in the Detroit area, including Ford Motor Co., Chrysler Corp., and Murray Corp. He will also serve as controller of Mission Appliance, it was explained.

10th Exposition--

(Concluded from Page 1, Col. 5) smaller unitary equipment and components that gain an advantage in compactness are going smaller.

In the replacement field, new tools and components were shown which will speed up installation, repair, and replacement operations.

Atlantic City will be the site of the next Exposition, late in 1959 or early in 1960.

(Concluded from Page 1, Col. 5) heating and cooling division and now a director and vice president-sales of Heil-Quaker, declared distribution of the integrated line would remain as it is now, except for contemplated expansion.

Quaker formerly was owned by Florence Stove Co. of Kankakee, Ill. Transfer of the Quaker space heating business and plant to Heil-Quaker took place in Chicago Nov. 18 following stockholders' approval of the sale, it was pointed out. Heil Co. is principal owner of the new firm, with Sears Roebuck & Co. holding a minority interest.

Joseph F. Heil, president of Heil, is chairman of the board of the new corporation. C. W. Milligan is president. He previously was head of Mira-Cold Corp., Chicago.



Milligan

George E. Hochstein, formerly general manager of the Heil



Jordan

division of Heil-Quaker which will make oil and gas-fired space heaters.

Earl R. Martin and Roy L. King, former Heil executives, are secretary and engineering director, respectively, of the new company. Henry Weyenberg, formerly with Quaker, is works manager.

ASRE By-Laws--

(Concluded from Page 1, Col. 4) technical papers presented at the meeting, there were three conferences held during the ASRE meeting. These were the Domestic Refrigerator Engineering Conference, which centered its attention on "Problems of Aluminum Usage in Refrigeration Systems"; the Refrigeration and Meat Packing Conference which covered "Refrigeration in Meat Packing and Related Industries"; the Air Conditioning Conference, which covered "Central Plant Air Conditioning for Multi-room Buildings"; and the Food Preservation Conference, which covered "The Present and Future Outlook for Food Preservation."

(Reports on the Conferences and on some of the technical papers will be published in future issues of the NEWS.)

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PRESSURE GAUGES and Dial Thermometers for all services.

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Dept. D, Skokie, Ill.



P. L. Chabre

SO HALSTEAD & MITCHELL
ENGINEERS SAID:

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COOLING TOWER
RUSTING and
ROTTING!"**



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BESSEMER BUILDING,
PITTSBURGH 22, PA.

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There's no "one-coat" protection which will stop cooling tower rust. Needed are super-strength bonding of protection to metal, toughness, inertness, flexibility, and a water-tight barrier. Only by Halstead & Mitchell are you offered the 3-coat protection of Vinsynite, Vinyl Zinc and chlorinated rubber—the most advanced protection ever devised to prevent cooling tower steel from rusting.

ROTTING

We do more than praise the long life of wood used in our wetted decks—we are the only manufacturer who offers a 20-Year Guarantee on wetted deck wood against rotting or attack by fungus.

AT LEADING WHOLESALERS EVERYWHERE

Servicing Automobile Air Conditioners (Vol. 2)

BY C. DALE MERICLE

The Vornado unit is the tenth make to be discussed in the current series on automobile air conditioners. Makes previously described in this series were A.R.A., Artic-Kar, Frigette, Frigikar, Kauffman, Mark IV, Airtemp, Mobilette, and Novi. Other makes by "independent" manufacturers will be described in future instalments, following which units of most automobile manufacturers themselves will be described.

Models discussed in the current series are 1956 and/or 1957. For data on earlier models readers are referred to the original series of articles, which is available now in the handy manual, *Servicing Automobile Air Conditioners*.

VORNADO (2)

The O. A. Sutton Corp., Inc.
1812 W. Second St.
Wichita 1, Kansas

Evaporator

Cooling case assembly of both the Vornado clutch and by-pass systems includes a semi-circular evaporator coil, thermostatic expansion valve, propeller type fan, air outlets, and controls.

Thermostatic control for

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Pipe Covering by Glo-Brite



For Low Temperature Lines & Original Equipment Manufacturers.

Pipe diameters from $\frac{3}{8}$ " iron pipe and copper tubing, to all large diameters and wall thicknesses, elbows and joints.

Light, standard and heavy duty for chiller unit cold storage work and heavy industrial installations.

GLO-BRITE PRODUCTS, INC.
6415 N. California Ave.
Chicago 45, Ill.

*Dow expanded polystyrene.

clutch systems is mounted in the cooling case assembly (Fig. 4).

By-pass valve and by-pass lines are part of the evaporator assembly in Vornado by-pass system (Fig. 5). Manual adjusting control of by-pass valve is also provided in the cooling case assembly.

Five round, multi-directional air outlet grilles are incorporated in the evaporator cabinet. Three are on the front of the cabinet, and there is one on each side.

Propeller type blower operates at three speeds: 2,600, 2,400, and 2,100 r.p.m.

Superheat setting of the thermostatic expansion valve is preset at the factory and should not be adjusted in the field.

Controls

Controls of the 1957 Vornado conditioner are located on the front of the cooling case assembly at the extreme left end.

A rotating three-speed blower control is provided on both clutch and by-pass models. The blower control knob is the top one on clutch models; the lower knob on by-pass models.

Thermostat controlling the magnetic clutch on Vornado units is adjusted by turning the lower knob on the control panel

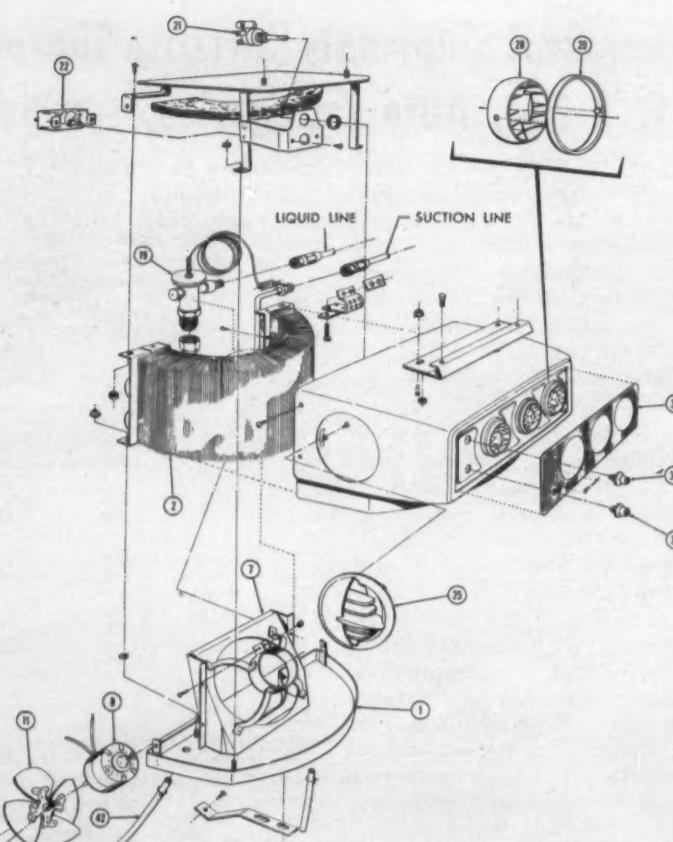


FIG. 4—Exploded view of evaporator assembly of 1957 Vornado unit with magnetic clutch. Key: 1—drain pan; 2—evaporator; 7—fan shroud and mounting; 8—fan motor; 11—fan; 19—expansion valve; 21—fan switch; 22—thermostat; 25—side air outlet; 28—front air outlet; 29—retainer ring; 30—cabinet insert; 33—fan switch knob; 34—thermostat knob; 42—drain hose.

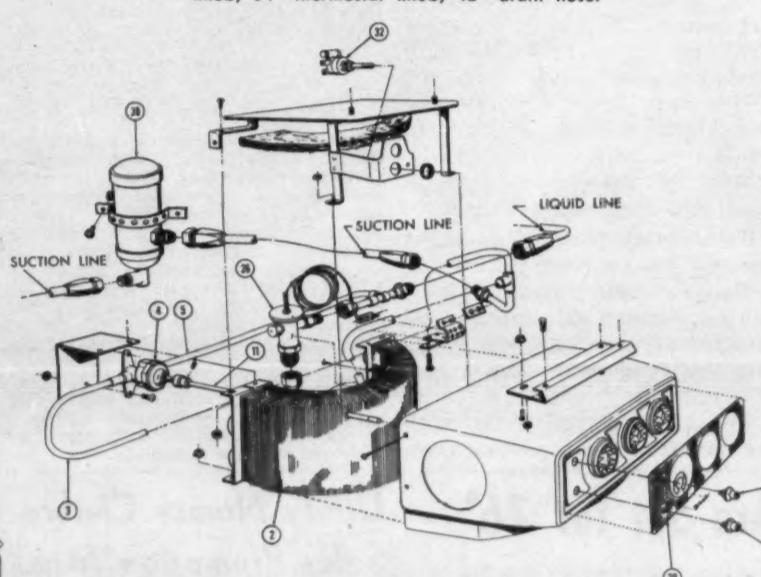


FIG. 5—Exploded view of evaporator assembly of 1957 Vornado unit with by-pass valve. (Fan and drain pan assembly, which is same as in Fig. 4, omitted.) Key: 2—evaporator; 3—by-pass to suction line; 4—by-pass valve; 5—liquid line to by-pass valve; 11—by-pass valve control rod; 26—expansion valve; 28—accumulator; 32—fan switch; 39—cabinet insert; 43—fan switch knob; 44—by-pass valve control knob.

at the left end of the cooling case (Fig. 4).

On by-pass models temperature adjustment is made by turning top knob on control panel of unit. A control rod extends from the panel through the evaporator coil to the by-pass valve located directly behind the left end of the coil (Fig. 5).

A by-pass line runs from the liquid line (just ahead of the expansion valve) to the by-pass valve, and then runs from the by-pass valve to the suction line, entering the suction line beyond

the location of the bulb of the expansion valve.

The by-pass valve is pressure controlled with a manual override.

By-passing refrigerant around the evaporator reduces the cooling effect, of course.

An accumulator tank is provided in the suction line on by-pass models to prevent returning liquid "slugs" to the compressor when a considerable quantity or most of the liquid refrigerant is being by-passed around the evaporator.

(To Be Continued)

Detroit ASRE To Hold Joint Meeting with ASHAE Dec. 2, Hear About Residential Conditioning

DETROIT — "Residential Air Conditioning Trends, Applications, and Control Problems" will be the subject of local section American Society of Refrigerating Engineers' annual joint meeting in Rackham Memorial Bldg. with the local unit of American Society of Heating & Air-Conditioning Engineers at 8:30 p.m. Dec. 2.

Willis Stafford, refrigeration sales engineer for Detroit Controls Corp., will give the main talk at the meeting. Leonard J. Czarniecki, executive secretary of the local Committee for Neighborhood Conservation and Improved Housing, will discuss "Detroit's Neighborhood Conservation Program."

Dinner will be served at 6:30 p.m. in Rackham Memorial Bldg. following a social hour from 5 to 6 p.m. in the Sapphire Room of the Park Shelton hotel, according to Ray E. Lee, Detroit ASRE Section secretary.

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PATENTS

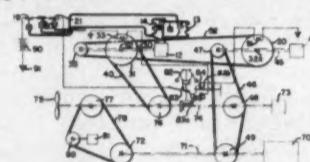
Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

Printed copies of patents, reissued patents, and patent designs may be secured from the Patent Office; patents and reissues are 25¢ each, while designs are furnished at 10¢ each. Address orders to: Commissioner of Patents, Washington 25, D. C.

Week of Sept. 24

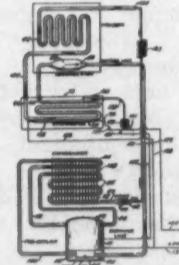
(Continued)

2,807,148. REFRIGERATING APPARATUS. James W. Jacobs, Dayton, Ohio, assignor to General Motors Corp., Detroit.



1. In combination: a vehicle; an engine driving said vehicle and having an engine shaft; a vehicle space to be cooled; a refrigerating system on said vehicle and including a compressor, condenser and evaporator in refrigerant flow relationship with said evaporator cooling said vehicle space; a rotatable compressor shaft operating said compressor; a compressor first speed ratio pulley freely rotatable on said compressor shaft; compressor first speed magnetic clutch for clutching said last pulley to said compressor shaft; belting from said engine shaft to said last pulley; a driven compressor second speed ratio pulley fixed on said compressor shaft; a separate driven element shaft on said vehicle driven by said engine; a driving compressor second speed ratio pulley freely rotatable on said last shaft; a compressor second speed magnetic clutch for clutching said last pulley to said last shaft; belting between said compressor second speed ratio pulleys; and means selectively energizing said magnetic clutches.

2,807,149. CYCLE DEFROST TYPE REFRIGERATORS. S. J. Williams, Jr., Evansville, Ind., assignor, by mesne assignments, to Whirlpool-Seeger Corp., a corporation of Delaware.



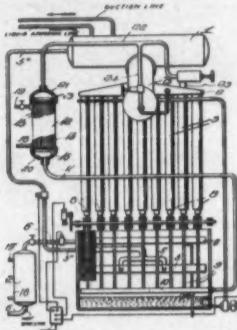
1. A household refrigerator of the multiple temperature type comprising an outer shell, an inner shell, insulation between said shell and liner, and breaker strips closing the space between the liner and shell surrounding a door opening, a door having a door seal for closing said opening, a separate freezer compartment comprising a second inner liner defining a box-like compartment at the top of the cabinet, sinuous coils covering the walls of said box-like compartment, which has a front door opening, an insulated cover for closing said latter front door opening, insulation between the first liner and the second liner, and also forming an insulating partition below said second liner, said partition forming the upper wall of a food storage compartment, a receiver carried by said second liner on its side wall, and connected to a suction line, a cycle defrost evaporator comprising a separate box-like container spaced from said first liner and located below said second liner inside said first liner, said box-like container having a side vertical wall and a rear vertical wall provided with a plurality of sinuous passes of refrigerant for cooling said vertical walls to provide a quick freeze compartment inside said box-like container and for cooling the compartment in which it is located, for storage of food above freezing...

(Continued on next page)

PATENTS

(Continued)

2,807,150. TEMPERATURE CONTROL FOR ICE MAKING MACHINE DEFROSTING GASES. Merlin S. Chapman, Wheeling, W. Va.



1. In an ice making machine having at least one upright cylinder for producing ice on the exterior thereof including a chamber connected to the lower end of said cylinder, a pipe for conducting a heating fluid to said chamber for loosening ice formed around the lower end of said cylinder

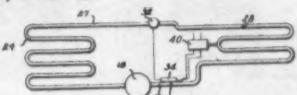


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KESCO CONDENSATE PUMPS
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and said chamber, a closed casing having said pipe connected at opposite ends thereof, a partition in said casing, a plurality of pipes extending through said partitions for the passage of fluid from said first mentioned pipe, controlled means for supplying steam at desired temperatures between said partitions and exteriorly of said plurality of pipes for superheating the fluid passing therethrough whereby fluid at a controlled high temperature will reach said chamber for loosening ice around said chamber and the lower end of said cylinder.

2,807,151. EXPANSION VALVE CONTROL. Marshall W. Baker, Dayton, Ohio, assignor to General Motors Corp., Detroit.



1. In an air conditioning system, a compressor, a condenser, an evaporator, refrigerant flow connections between said compressor, condenser and evaporator, a thermostatic expansion valve in said connections adjacent the inlet side of said evaporator, said thermostatic expansion valve including thermal means responsive to the temperature at the outlet of said evaporator for controlling the flow of refrigerant through said valve, means for applying heat to said thermal means in response to a predetermined decrease in the pressure within said evaporator so as to cause opening of said valve for the purpose of preventing the temperature of said evaporator from falling below a predetermined value.

(To Be Continued)

Carrier Has Seminar

CHARLOTTE, N. C.—Some 125 air conditioning dealers from the two Carolinas and Virginia converged on Charlotte recently for a two-day business management seminar conducted by Carrier Corp.

CLASSIFIED ADVERTISING

RATES for "Positions Wanted" \$7.50 per insertion. Limit 50 words. 15¢ per word over 50.

RATES for all other classifications \$10.00 per insertion. Limit 50 words. 20¢ per word over 50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other address by actual word count. Please send payment with order.

POSITIONS WANTED

REFRIGERATION ENGINEER — Graduate with successful 10-year background in designing domestic and commercial refrigeration products including air conditioners and heat pumps, with proven ability to supervise engineers in all phases of product through production, desires responsible position with company in the South or West Coast. Reply to BOX A5915, Air Conditioning & Refrigeration News.

POSITIONS AVAILABLE

AGENTS AND DISTRIBUTORS to handle the only all aluminum line of Grilles, Dampers and Diffusers at prices competitive with steel, no rust, light weight. Easy to handle. Write D. F. BOWMAN CO., INC., P. O. Box 23, New Albany, Indiana.

MANUFACTURERS' REPRESENTATIVES. Southwest and some other territories available for established line of Chenco products. Complete line of liquid and dry scale removers, liquid and dry algaeicides and water treatments. Contact CHEMICAL ENGINEERING CO., INC., P.O. Box 1076, Dallas, Texas.

SERVICEMAN FOR Carrier dealer. Must have approximately fifteen years' experience in service and installation of commercial and industrial refrigeration and air conditioning. Applicant should be qualified to supervise a complete installation. Year-round employment. State qualification in reply to: POLAR REFRIGERATION CO., 2540 St. Antoine St., Montreal, Canada.

AIR CONDITIONING sales engineer, capable of bidding mechanical sections of plan and spec jobs, design of packaged and central station year round systems, develop business with contractors, architects and investors. Write to JAMES THOMPSON, 5001 E. 59th Street, Kansas City, Mo. for interview. State age, earnings expected and type of previous experience.

ONE OF cities largest retail heating and air conditioning dealers handling nationally advertised line of equipment offers fine opportunity for air conditioning salesman. Must have technical

knowledge of residential application and service. Write giving full information on your background past and present. Employment and earning record. BOX A5911, Air Conditioning & Refrigeration News.

WANTED — MANUFACTURER'S agents—Country wide for supermarket equipment. Quality checkstands and shelving. Write, stating experience and qualifications. BOX A5912, Air Conditioning & Refrigeration News.

QUALITY CONTROL manager — for Chicago heating and air conditioning plant of national manufacturing company. Complete charge of inspection function. Practical inspection background in air conditioning necessary. Also needed, for same plant—Plant Engineer—plant layout, maintenance, estimating, die design, some industrial engineering helpful. Write, full details, including work history, product experience, and salary requirements. BOX A5913, Air Conditioning & Refrigeration News.

PRODUCTION FOREMAN — practical experience in manufacture and assembly of air conditioning units a pre-requisite. Must be able to direct and coordinate production activities; ability to handle men also extremely important. Send complete resume to BOX A5914, Air Conditioning & Refrigeration News. All replies held confidential.

SALES ENGINEER: Excellent opportunity in expanding OEM sales department of well known manufacturer of control valves and devices. Engineering education desirable. Development or application experience in refrigeration, air conditioning, or heating essential. In reply state education, experience, earnings, personal data. Interviews arranged with qualified applicants. Replies held in confidence. BOX A5916, Air Conditioning & Refrigeration News.

EQUIPMENT WANTED

WANTED: USED ice machines, preferably Scotsman flaker & cubers. In reply state model, year, serial, condition and asking price. Can use one or fifty. WATERS EQUIPMENT COMPANY INC., phone RE 7-5377, 4602 North Dale Mabry, Tampa, Florida.

MISCELLANEOUS

ATTENTION SERVICEMEN: Send for free circulars and bulletins on refrigeration parts and equipment. Real money saving values: WALTER W. STARR, 2838 Lincoln Avenue, Chicago 18, Illinois.

ASRE Food Preservation Conference--

(Concluded from Page 1)
quality will not hold back public desire for more frozen foods.

3. The Armed Services appear to be headed in the direction of making use of dehydrated and freeze-dried products as much as possible, particularly in areas where the forces may be serving outside of the continental limits of North America.

Problems In Irradiation Preservation of Foods

Pointing out that the more research that is done on the irradiation preservation of foods, the greater number of problems appear to develop, Dr. W. M. Urbain, associate director of research, Swift & Co., pointed out major "problem areas" with such processing methods as:

1. Research is indicating much greater radiation requirements for adequate sterilization of foodstuffs than was originally calculated—perhaps as great as 2½ times as much.

2. Since the amount of radiation necessary has a direct bearing on sensory changes in food—changes in flavor, appearance, and texture—it would seem probable that such changes will be more pronounced. And foods are acceptable to the general public primarily on the basis of their sensory characteristics.

3. Many foods spoil because of enzyme activity. The radiation dosage required to inactivate enzymes is several times greater than that required for bacterial destruction.

4. There is considerable concern over the possible effect of irradiation processes on the "wholesomeness" of foods—the thought that the process might develop some harmful side effects or the loss of nutritive values.

High Cost of Radiation Sources Cited

5. There is considerable question over the "availability at a reasonable cost" of radiation sources. A gamma ray producer at a cost that would be in line with commercial production needs hasn't made its appearance, apparently, and the electron beam type of radiation demands voltages that may go as high as 25 million volts.

6. Utilization of radiation for food sterilization calls for special containers that would not permit the re-entry of bacteria. These could conceivably be more expensive than containers for foods preserved by other methods.

Freezing and dehydrofreezing processes are now accounting for more than 4% of the total U.S. food production, and this figure could go rather quickly to 10%, but in order for this to happen, new and almost revolutionary systems of food distribution will be required, along with the fulfillment of special demands on the physical facilities and intelligence of those connected with frozen food distribution.

So said Dr. M. J. Copley, director, Western Research and Development Division, Agricultural Research Administration, Department of Agriculture.

The principal retarding force

in the growth of the frozen food industry is the fact that frozen food is often poor in flavor, appearance, and nutritive value by the time that the public is ready to cook or consume it. This hurts repeat purchases, sometimes for long periods of time, and thus slows down the growth of the business.

Deterioration in quality stems from the problem of making products available everywhere all of the time and at competitive prices, said Dr. Copley.

The industry's problem, he said, is to find out what can be done to correct conditions so that the product will arrive at the consumer's table, if not in ideal, at least in a suitable condition.

Refrigeration is of course all important, because it is rise in temperature which brings about deterioration of the frozen food. What the industry needs to know is where the temperature rises occur, and how much can be tolerated.

Temperature Rise Tests Reported

Studies made on the effects of temperature rises, in fruits such as strawberries for example, reveal the following:

Tests were made on temperature rises of 0° to 10° F., and 0° to 20° F. Changes in flavor, color, and vitamin C content were checked.

With the temperature rise to 10° F., and held at that point for a long period of time, changes in flavor and color would be discerned in 45 days, and the vitamin C content was lowered.

When the temperature went to 20° F. and was held there, it was almost inevitable that marked changes would be noticed before the product got to the user's home freezer, if the time elapsed were only a few days.

In the 20° F. temperature, there is almost four times as much damage as holding at 10°.

Adverse changes in frozen foods are cumulative, and the net effect is cumulative. Return of temperatures to 0° F. will not undo the damage.

Dr. Copley asks for better techniques in keeping surveillance of products in the whole distribution setup. He suggested that if it were possible to obtain complete records of product temperatures at all stages of

distribution, it would be possible to compute the damage done to the product. But they will have to be product temperatures, not environmental temperatures.

Would a short wave tele-meter, broadcasting temperatures to a receiving station, be better than recording thermometers for such purposes, he asked.

New Dehydrating and Freeze-Drying Methods

Several new methods for dehydrating and freeze-drying all kinds of foodstuffs were described by Dr. D. K. Tressler, technical director, U.S. Quartermaster Corps Food and Container Institute for the Armed Forces.

Freeze-drying has advantages in that it seems to preserve the taste of some products better, and also helps in reducing foods to the 4% or less moisture content that is necessary.

He pointed out that techniques have been and are being developed for almost every type of food, and that reconstitution of the foods is now a simple task, with some whole meals being reconstituted by being placed in boiling water.

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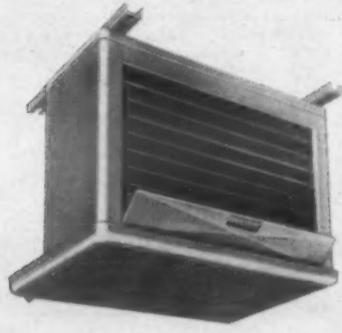
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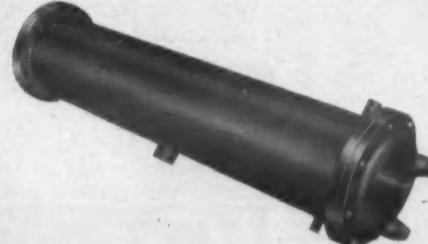
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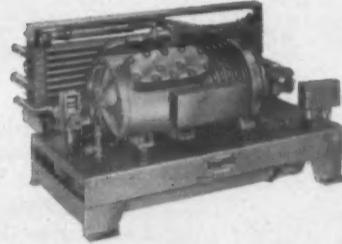
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